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THE STANFORD EXPEDITION TO BRAZIL, 1911

J. C. BRANNER, DIRECTOR

ORTHOPTERA II

BY JAMES A. G. REHN

For explanatory remarks regarding the collections here treated the student is referred to the prefatory notes in the first paper of this series,¹ which bears the subtitle "Dermaptera and Orthoptera I." This final portion of the study embraces the species belonging to the families Tettigoniidae and Gryllidae. As in the previous paper, certain records of material taken at Pará, State of Pará, by C. F. Baker, and at Peixe Boi, a short distance east of Pará, by H. B. Merrill, have also been included, but only where it was desirable to amplify comments on the Stanford Expedition representation. A few specimens from Porto Velho, Rio Madeira, belonging to Cornell University, have also been included to augment the representation from that locality, while certain other specimens from eastern Peruvian localities, belonging to the Academy, have been studied in connection with the Rio Madeira material, and are here reported.

In the present paper sixty-two species, belonging to forty genera, are treated, of which fifteen species and one genus are described as new. The total number of specimens reported in this paper is three hundred and sixteen.

TETTIGONIIDAE

PHANEROPTERINAE

Hyperophora branneri new species (Plate III, figs. 1 and 2.)

A very striking species, having male cerci in general resembling those of *H. brasiliensis*, *cerviformis*, *major* and *gracilis*, but lacking the slender distal portion found in those species, while the whole distal portion of the same appendages of *branneri* is inflated or rather sub-bulbous. The general form is similar to that of *brasiliensis*, but the limbs are somewhat more robust and the pronotum is broader, with the lateral carinae more angulate.

¹ Trans. Am. Ent. Soc., xlii, pp. 215 to 308, pls. xiv and xv, (1916).

When compared with *H. minor* the new species is found to differ in numerous features other than the cercal form, while from *H. abrupta*, described beyond, *branneri* can be separated by the characters given under that species.

Type.—♂; Independencia, State of Parahyba, Brazil. (Stanford Expedition; Mann and Heath.) [Acad. Nat. Sci. Phila., Type no. 5294.]

Size medium: form considerably elongate. Head with the dorsal length about one-half that of the dorsum of the pronotum: occiput regularly and rather strongly declivent to the apex of the fastigium; the latter narrow, acuminate, subcompressed, sub-sulcate dorsad, apex almost touching the fastigium of the face, the latter being acute-angulate in form: eyes prominent, semi-globose in form when seen from the dorsum, very short-ovate in basal outline, their depth slightly more than one-half that of the infra-ocular portion of the genae: antennae elongate, fragile, proximal joint but little smaller than the eye. Pronotum moderately elongate, weakly sellate, the disk of the pronotum with its greatest caudal width equal to two-thirds of the greatest length; cephalic margin of disk moderately arcuato-emarginate, caudal margin of disk equally arcuate; lateral angles of disk distinct, sharp, weakly and regularly expanding caudad; transverse impression on disk in general form rectangulate: lateral lobes of pronotum with greatest depth contained one and two-thirds times in the length of the same; cephalic margin straight, ventro-cephalic angle obtuse-subrectangulate, ventral margin straight and weakly oblique on cephalic two-thirds, then strongly full arcuate over the caudal margin to the rectangulate humeral sinus. Tegmina surpassing the tips of the caudal femora, but falling considerably short of the wing tips, in form elongate-lanceolate, the apex narrowly rounded, the form very faintly tapering from the proximal fourth to the distal sixth: mediastine vein incomplete or lacking; discoidal vein with three regular rami to the sutural margin, these connected in the fashion usual in the genus: stridulating field elongate, relatively narrow, for venation see figure. Wing with distal portion subcoriaceous like the tegmina, acuminate, surpassing the tegmina by a distance equal to twice the length of the pronotal disk. Abdominal segments weakly carinate dorsad, the penultimate dorsal segment produced mesad into a rectangulate process which overhangs the supra-anal plate, the lateral margins of this process faintly concave and the median line weakly carinate, the form in section subtectate: disto-dorsal abdominal segment narrow, strongly transverse: supra-anal plate slightly acute trigonal, the margins thickened in a fashion increasing to the immediate apex, margins hirsute: cerci with the shaft moderately tapering, gently arcuate mesad and dorsad, hirsute; the apex developed on the internal face, which bears a moderately inflated process similar to that found mesad in the same region in *brasiliensis* and related species, this process bearing a sharp point, ending in a short decurved tooth, directed cephalad, while the distal extremity of the whole cercus is bluntly subtruncate with three low, sub-tuberculate bosses, the dorsal surface of the cercal process with usual sculpture of the species

of the genus: subgenital plate of medium length, narrowing distad, the apical margin rectangulate emarginate, the lateral angles produced, no styles present; the surface of the plate tricarinate. Limbs very slender and elongate, femora unarmed beneath, cephalic and median genicular lobes bispinose, caudal genicular lobes unispinose: caudal femora about five-sixths as long as the tegmina, for the genus moderately inflated proximad.

Allotype.—♀; Baixa Verde, State of Rio Grande do Norte, Brazil. (Stanford Expedition; W. M. Mann.) [Acad. Nat. Sci. Phila.]

Differing from the description of the male sex in the features here specified. Lateral lobes of the pronotum faintly shorter in proportion to their depth, the latter contained one and one-half times in the greatest length of the same, caudal margin of lobes more flattened. Wings surpassing the apices of the tegmina by about one and one-half times the length of the pronotal disk. Abdominal segments of the more normal type, the penultimate segment with a faint median angular projection; supra-anal plate of the same general form as in the male, but without the greatly thickened margins; cerci of medium length, tapering, apices slender; ovipositor subequal in length to the dorsum of the head and pronotum, strongly arcuate, hardly bent proximad, slightly more than half of the dorsal margin and two-thirds of the ventral margin crenulato-dentate, surface of the valves distad with minute asperities; subgenital plate elongate trigonal, the apex weakly emarginate.

All the specimens of this species which we have seen, excepting one, have been preserved in a liquid preservative, and in consequence have lost all their coloration aside from certain brownish markings. This single individual (Bonito, State of Pernambuco, Brazil) shows that the base color of the head, thorax, abdomen and limbs is antimony yellow, of the tegmina and exposed portion of the wings lettuce green. The brownish lines, which are auburn to bay, mark the lateral carinae of the pronotal disk, the angle of the anal-discoïdal fields of the tegmina and the greater portion of the sutural margin, also extending cephalad to and across the eyes. The base color of the latter is slightly paler than the bars. The antennae are more or less infusate.

Measurements (in millimeters)

	Independencia ♂ (type)	Baixa Verde ♀ (allotype)
Length of body (exclusive of ovipositor).....	16	18.1
Length of pronotum.....	3.5	3.9
Greatest (caudal) width of pronotal disk.....	2.8	2.9
Length of tegmen.....	25.8	24.5
Greatest (median) width of tegmen.....	4.2	4.8
Length of wing distad of tegmen.....	7.3	5
Length of caudal femur.....	20.4	19.7
Length of ovipositor.....		5.7

In addition to the type and allotype we have before us six paratypes from the following localities and sources:

Independencia, State of Parahyba, Brazil; (W. M. Mann); one male.

Baturite Mountains, State of Ceará, Brazil; (W. M. Mann); three males, one female.

Bonito, State of Pernambuco, Brazil; (A. Koebele); one male; [U. S. N. M.].

We have also examined two immature females from the Baturite Mountains. The only feature in the series which seems worthy of comment is the length of the ovipositor in the two females. The Baturite Mountains female has this considerably greater than in the allotype (6.5 instead of 5.7 mm.) and the apex is faintly more arcuate.

We take great pleasure in dedicating this species to Dr. J. C. Branner, the distinguished geologist, who led the expedition which secured the present material.

Hyperophora abrupta new species (Plate III, figs. 3 and 3a.)

This interesting species has much in common with *H. branneri*, having a similar general form and the same type of abbreviate male cerci, but the latter instead of having their expansion inflated, as in *branneri*, have it of a more usual (for the genus) form with the regular sculpture, the dorsal abdominal segments are more carinate mesad, the distal carinate segment less produced and the apices of the tegmina more acute.

Type.—♂; Natal, State of Rio Grande do Norte, Brazil. (Stanford Expedition; W. M. Mann.) [Acad. Nat. Sci. Phila., Type no. 5296.]

Size medium: form elongate. Head with its dorsal length slightly more than one-half the dorsal length of the pronotal disk; occiput regularly declivent; fastigium quite acuminate, subcompressed, faintly elevated and weakly sulcate dorsad, apex very narrowly separated from the fastigium of the face, the latter acute-angulate: eyes prominent when seen from the dorsum, subcircular in basal outline, their depth very slightly more than one-half that of the infra-ocular portion of the genae: antennae as usual in the genus, proximal joint relatively shorter and broader than in *branneri*. Pronotum shorter than in *branneri*, equally sellate, the disk of the pronotum with its greatest caudal width equal to three-fourths of the greatest length; margins of disk and lateral angles as in *branneri*; depression on disk as in *branneri*: lateral lobes of pronotum with the greatest depth of the same contained one and one-half times in

the greatest length; cephalic margin of the same slightly sinuate, angles and remaining margins of the lobes as in *branneri*. Tegmina falling very slightly short of the tips of the caudal femora, failing to reach the apices of the wings by slightly more than the dorsal length of the pronotum, in form moderately lanceolate, broader than in *branneri*, apex narrowly rounded, sutural in position, the form faintly tapering from the proximal third: mediastine vein incomplete; discoidal vein with three regular rami to the sutural margin, these with the usual connecting sectors: stridulating field proportionately shorter and broader than in *branneri*; for venation see figure. Wings with the distal portion subcoriaceous like the tegmina, apex injured in type, presumably acuminate. Abdominal segments weakly carinate dorsad, the penultimate dorsal abdominal slightly produced mesad into an obtuse-angulate, dorsad compressed projection, which bears a number of setae, lateral margins of this projection very faintly arcuate-emarginate: disto-dorsal abdominal segment strongly transverse, narrow, mesad broadly obtuse-angulate emarginate: supra-anal plate subtrigonal, distal margin obtuse-angulate and thickened and hirsute as in *branneri*; cerci of a character which much suggests those of *brasiliensis* and *peruviana* with the slender distal portion missing, the shaft is tapering to about the distal two-thirds, straight when seen from the dorsum, slightly ascending distad when seen from the side, distal third bent inward and subdepressed, expanding into a structure of the type placed mesad in *brasiliensis* and allied species, the distal prong narrowing and with a blunt tooth, the proximal section broader and excavate with a short, recurved, apical tooth, the free (internal) margin of this process sigmoid in outline, the portion proximad thickened: subgenital plate as in *H. branneri*. Limbs less elongate than in *H. branneri*; femora unarmed beneath, cephalic and median genicular lobes bispinose, caudal genicular lobes unispinose; caudal femora very slightly shorter than the tegmina.

General color pyrite yellow passing into pale old gold on the head and pronotum and to cource green distad on the tegmina and wings. Antennae distad of and including the second joint washed with pale morocco red, weakening distad; eyes brussels brown. Pronotum with the lateral angles of the disk lined with pale morocco red. Tegmina with the region of the anal vein broadly washed with dull claret brown. Femora more or less suffused with pale morocco red. Abdomen largely dull aniline yellow.

Length of body, 16 mm.; length of pronotum, 3.6; greatest (caudal) width of the pronotal disk, 2.9; length of tegmen, 22.8; greatest width (at proximal third) of tegmen, 4.2; length of caudal femur, 21.

The type of this interesting species is unique.

***Dolichocercus*² *peruvianus* (Brunner)**

1891. *Hormilia peruviana* Brunner, Verh. K.-K. Zool.-botan. Gesell. Wien, xli, p. 117. [Sarayacu, Peru.]

Pará, Pará. (C. F. Baker.) One female.

² See Rehn and Hebard, Trans. Am. Ent. Soc., xl, pp. 39 and 40, (1914).

We are referring this specimen tentatively to *peruvianus*. It agrees with the description very well, yet has the tegmina slightly broader mesad (3.6 mm. instead of 3); however, as the whole insect is somewhat larger than Brunner's measurements this difference may be entirely proportional.

Ceraia grandis new species (Plate III, figs. 4 and 5.)

Apparently related to *C. tibialis* and *maxima* Brunner, the former from Fonteboa, upper Amazonia, the latter from Sorata, Bolivia; differing from *tibialis* in the less arcuate ovipositor, less strongly spined ventral margins of the caudal femora, broader tegmina and certain features of the coloration, such as the absence of blackish from the caudal tibiae. From *maxima*, to which it is apparently more nearly related, the new form can be distinguished by the shorter caudal femora, more numerous teeth on the ventral margins of the same, the shorter ovipositor and the non-ferruginous caudal tibiae. The male sex of both of the older species is unknown, so comparisons have been made solely on the basis of the female.

Type.—♂; Porto Velho, Rio Madeira, Brazil. (Stanford Expedition; Mann and Baker.) [Acad. Nat. Sci. Phila., Type no. 5299.]

Size very large (equal to some individuals of the genus *Stilpnochloa*): form subcompressed: surface moderately polished. Head with the occiput gently arcuate, hardly elevated dorsad of the general level of the pronotum; fastigium subhorizontal, compressed, faintly sulcate, the apex weakly bulbous and in contact with the rather elongate, subequal, facial fastigium: eyes hardly prominent when seen from the dorsum, nearly circular in basal outline, their depth faintly greater than that of the infra-ocular portion of the genae: antennae reaching to the tegminal apices. Pronotum with the disk deplanate, its greatest caudal width equal to three-fourths of the greatest length of the same: cephalic margin of disk very faintly arcuato-emarginate, caudal margin strongly arcuate, forming more than the curve of a quadrant; lateral angles of disk well rounded cephalad, narrowly rounded but of distinct character caudad; surface of disk sparsely impresso-punctulate, particularly caudad, with the median figure very broadly U-shaped, the caudal section of the disk somewhat depressed below the general level: lateral lobes of the pronotum with the greatest depth surpassing the greatest length of the same, cephalic margin sinuate, ventro-cephalic angle, ventral margin and ventro-caudal angle regularly and strongly arcuate, caudal margin arcuate, humeral sinus rotundato-rectangulate. Tegmina with their length slightly more than six times that of the pronotal disk, in form rather elongate lanceolate, the greatest width

contained more than four times in the length; costal margin gently arcuate throughout but more flattened proximad; sutural margin straight for the greater portion of its length distad of the stridulating field, distal fifth of the margin oblique rotundato-truncate, the apex nearer the costal margin and rotundate-acute; mediastine vein short, irregular, ramose; humeral and discoidal veins contiguous to about the middle of the tegmen, distinctly separated thence; median vein diverging at the proximal two-sevenths of the tegmen, bifurcate faintly distad of its middle, the rami reaching the oblique portion of the sutural margin; ulnar vein straight, except for a faint distal curve toward the sutural margin; transverse nervures rather regularly spaced and quite distinct; stridulating field with the oblique vein strong, broad, depressed, the field heavily coriaceous and strongly punctato-reticulate. Wings surpassing the tegmina by faintly more than the length of the pronotal disk, acute. Prosternum unspined; mesosternum with slightly acute-angulate lobes; metasternum with the lobes rounded laterad, the two lobes are produced meso-caudad into an acute projection around the metasternal foramen. Disto-dorsal abdominal segment large, distal margin deflexed mesad, when seen from the dorsum obtuse-angulate impressed, and when seen from the caudal aspect with that portion of the margin itself subtruncate with a narrow median, V-shaped fissure, laterad of this median section the margin is rotundato-rectangulate with a short but distinct, thick, styliform, articulate process: cerci rather stout, thickened distad, gently incurved and arcuate ventrad, the apex with a rectangulate-reflexed, acute spine, directed dorso-mesad: subgenital plate greatly elongate, arcuate when seen from the lateral aspect, through the greater portion of its length subequal in width, slightly expanding distad, the distal extremity rounded obtuse-angulate emarginate, ventral surface with three elevated ridges, the lateral or marginal ones thinner but more decided than the median one. Cephalic and median femora unarmed beneath: cephalic tibiae with three spines on the dorso-caudal margin; median tibiae with five spines on the same margin. Caudal femora equal to slightly more than two-thirds of the length of the tegmina, armed on the ventro-external margin with four and on the ventro-internal margin with six to seven spines, genicular lobes of caudal femora bispinose.

Allotype.—♀; same data as type. [Acad. Nat. Sci. Phila.]

The features here given for the female sex are the unisexual ones not given in the above description of the male type. Pronotum with the humeral sinus well rounded obtuse-angulate. Disto-dorsal abdominal segment damaged; ovipositor slightly more than half again as long as the pronotal disk, arcuate proximad, nearly straight distad, faintly and regularly narrowing in width throughout; apex subangularly rounded, slightly oblique subtruncate ventrad; surface punctulate; distal half of dorsal margin, apex and extremity of ventral margin serrulato-denticulate: subgenital plate broad, lateral margins arcuate-emarginate, covering distad; distal margin subtruncate; in section the plate is elevated mesad with a pair of converging folds laterad of the same. Caudal femora with the ventro-lateral margin bearing as many as six spines, the ventro-internal margin as many as eight spines.

General color oil green, the head, pronotum, pleura, abdomen, tegmina, exposed portion of the wings and limbs to variable degrees, wax yellow to aniline yellow, but to what degree the yellow is natural and not due to drying or discoloration we cannot say. Eyes sudan brown. Antennae argus brown in the greater portion of their length. Ovipositor with the tip and distal portions of the margins argus brown.

Measurements (in millimeters)

	♂ (type)	♂ (paratype)	♂ (paratype)	♀ (allotype)
Length of body (in ♀ exclusive of ovipositor)	29.5	28.5	28	31.8
Length of pronotum	8	7.9	7.1	8
Greatest (caudal) width of pronotal disk	6	6.1	5.7	6.7
Length of tegmen	51.3	48.6	47.2	54.6
Greatest width of tegmen	12	11.8	10.8	13.4
Length of caudal femur	35	35.5	33	36.7
Length of ovipositor				13.2

In addition to the type and allotype we have before us two paratypic males, bearing the same data as the described specimens. The spines on the ventral margins of the caudal femora vary in number, on the external margin from four to six, and on the internal margin from five to eight, one individual having four on one external and six on the other, while another specimen has five on one internal and seven on the other. In all the more important features the four specimens are quite constant.

Ceraia madeirensis new species (Plate III, figs. 6 and 7.)

While we have only the female sex of this species it shows sufficient separation, in the way of differential characters, to make its description necessary. It is apparently nearest to *C. punctulata* and *dentata* Brunner, but from the former it differs in the rounded instead of trigonal metasternal lobes, in the ovipositor having but the distal extremity of the ventral margin crenulate and in its lesser size. From *dentata* the angulate mesosternal lobes will immediately separate *madeirensis*.

We do not think the present form could be the female sex of *C. surinamensis* Brunner, known only from the male. The new species has some similarity to *C. festae* Giglio-Tos, described from Ecuador and of which we have both sexes, but differs in the form of the lateral lobes, proportions of the tegmina, relative size of

the ovipositor and limbs and the form of the subgenital plate. It has much resemblance to *cornutoides* Caudell, from Paraguay, northern Argentina and south-central Brazil, but the subgenital plate of the female is different and the insertion of the lateral lobes distinctive.

Type.—♀; Porto Velho, Rio Madeira, Brazil. (Stanford Expedition; Mann and Baker.) [Acad. Nat. Sci. Phila., Type no. 5301.]

Size average for the genus: form moderately compressed: surface with the polish usual in the genus. Head with the occiput weakly arcuate, faintly elevated dorsad of the plane of the pronotum, slightly flattened cephalad; fastigium moderately declivent, weakly sulcate, the apex weakly bulbous and separated by a distinct, transverse depression from the remainder of the fastigium, the apex fully in contact with the relatively narrow facial fastigium: eyes hardly prominent, subcircular in basal outline, this slightly flattened cephalad; depth of the eye faintly greater than that of the infra-ocular portion of the genae. Pronotum with the disk deplanate, the greatest caudal width of the latter contained one and one-third times in the greatest length of the disk: cephalic margin of the disk subtruncate; caudal margin strongly arcuate, forming more than a quadrant; lateral angles of the disk narrowly rounded, more broadly so cephalad than elsewhere; surface of the disk rather sparsely punctate, median figure broadly U-shaped, deeply impressed: lateral lobes distinctly deeper than long; cephalic margin sinuate, thence regularly arcuate ventrad, caudad and finally dorsad to the infra-humeral obtuse-angulation, humeral sinus rotundato-rectangulate. Tegmina surpassing the apices of the caudal femora by slightly more than the length of the pronotal disk, elongate lanceolate, greatest width contained four times in the greatest length of the tegmen: costal margin arcuate distad, somewhat flattened proximad; sutural margin distad of the anal field straight except in distal sixth, where it is obliquely rotundato-truncate, the apex broadly rounded acute-angulate: mediastine vein subobsolete, very short; humeral and discoidal veins contiguous in proximal half, moderately separated thence distad; median vein diverging from the discoidal vein at about the proximal third, bifurcate, the branches reaching the sutural margin at the arcuation where the oblique distal portion of the margin joins the major portion; ulnar vein faintly sinuate; transverse nervures numerous, well marked, subparallel, oblique. Wings surpassing the apices of the tegmina by one and one-half times the dorsal length of the pronotal disk, apex subacute. Prosternum unarmed; mesosternal lobes rectangulate; metasternal lobes arcuate laterad, subtruncate caudad. Abdomen with the disto-dorsal segment weakly tectate, the surface impressed on each side of the median line, distal margin subtruncate with a very slight, shallow V-emargination mesad, distinct emarginations present at the cercal bases: supra-anal plate rectangulate, surface with a U-shaped depression: cerci rather short, incrassate, the tips sharply attenuate, general form of the cercus somewhat arcuate: infra-cercal plates subreniform in outline, surface

weakly strumose ventrad: ovipositor faintly more than one and one-half times as long as the disk of the pronotum, moderately arcuate in proximal half, thence distad nearly straight, faintly tapering; dorsal margin bent arcuate at the proximal third, thence straight to the rotundato-truncate apex, ventral margin moderately arcuate; distal half of dorsal margin, apex and extremity of ventral margin serrulate: subgenital plate trigonal, with the apex rotundato-truncate. Cephalic and median femora unarmed ventrad; cephalic tibiae with two to three spines on the dorso-caudal margin. Caudal femora three-fourths as long as the tegmina, relatively slender, genicular lobes briefly bispinose, ventro-external margin with three spines, ventro-internal margin with six to seven spines.

Coloration almost completely destroyed by immersion in liquid preservative. The discoidal field of the tegmina shows two, and traces of a third, longitudinal series of darker spots. The foramina on the cephalic tibiae and all of the infra-cercal plates except their small strumose section, black.

Length of body (exclusive of ovipositor), 24 mm.; length of pronotum, 5.7; greatest dorsal (caudal) width of pronotum, 4.6; length of tegmen, 36.5; greatest width of tegmen, 9.2; length of caudal femur, 27.2; length of ovipositor, 9.5.

The type is unique.

***Ceraia cornuta* Brunner**

1891. *Ceraia cornuta* Brunner, Verhandl. K.-K. Zool.-botan, Gesell. Wien, xli, p.130. [Fonleboa, Amazonas, Brazil.]

Pará, Pará. (C. F. Baker.) One female.

This specimen full agrees with the original description, based on the male sex, in the characters found in both sexes. The characters of the female genitalic features are summarized to help in the recognition of that sex of the species. Anal segment (disto-dorsal abdominal segment) as in the male; supra-anal plate small, acute trigonal; cerci stout at base, regularly tapering, arcuate incurved, apex acute: ovipositor in length half again as long as the pronotal disk; moderately bent arcuate at the proximal third of the dorsal margin, this straight distad, ventral margin regularly arcuate; depth of ovipositor subequal, apex rotundato-subtruncate, crenulato-denticulate on distal third of dorsal margin, at apex and briefly on the ventral margin: subgenital plate V-shaped in section, short, distal margin bisinuate emarginate: infra-cercal plates produced ventro-distad in an acute, digitiform, compressed lobe, which moderately embraces the ovipositor base. This specimen measures as follows: length of body (exclusive of ovipositor), 23.2 mm.; length of pronotum, 6.7; greatest (caudal) width of pronotal disk, 4.5; length of

tegmen, 38.8; greatest width of tegmen, 8.5; length of caudal femur, 28.2; length of ovipositor, 9.6.

The species was previously known only from the type locality.

Euthyrrhachis gracilis Brunner

1878. *E[uthyrrhachis] gracilis* Brunner, Monogr. der Phaneropt., p.331, pl. vii, fig. 95. [Paramaribo, Surinam.]

Porto Velho, Rio Madeira. (M. Bolton.) One female.

Igarapé-assú, Pará. (H. S. Parish.) One male.

In the original description Brunner states that the cephalic and median femora are unspined ventrad, but later he modifies this to "submutica" and "raro-spinulosa."³ In both of the present specimens the ventro-cephalic margins of the cephalic femora have two to four, and of the median femora, four spines. The ventro-external margins of the caudal femora bear six spines in the female and six to seven in the male; the ventro-internal margins of the caudal femora bear seven to nine spines in the female, six to seven in the male.

The species has been previously recorded from Paramaribo, Surinam and Fonteboa, upper Amazonia.

Scaphura nigra (Thunberg)

1824. *Gr[yllus] niger* Thunberg, Mém. Acad. Imp. Sci. St. Pétersb., ix, p. 415. [Brazil.]

Baturite Mountains, Ceará. (W. M. Mann.) One female.

This specimen is similar to that described by Perty as *ferruginea*,⁴ except for the restriction of chalybeous on the abdomen to mere edgings on the proximal segments and its complete absence from the limbs, while the ochraceous patch on the ventral section of the lateral lobes of the pronotum, mentioned by Perty, is well marked. It is somewhat smaller than the average from southern Brazil and Paraguay, but does not appear separable from those from more austral localities.

Steirodon validum Stål

1874. *S[teirodon] validum* Stål, Recen. Orthopt., ii, p. 44. [No locality.]

Obidos, Pará. One female.

³ Verhandl. K.-K. Zool.-botan. Gesell. Wien, xli, p. 132, (1891).

⁴ Delect. Anim. Art. Brasil., p. 120, pl. xxiii, fig. 11, (1834).

The only published records of this species are from Surinam; Brazil and Sapucay, Paraguay.⁵

Peucestes striolatus Brunner

1878. [*Peucestes*] *striolatus* Brunner, Monogr. der Phaneropt., p. 366. [Pernambuco and Bahia, Brazil; Panama; Peru.]

Pará, Pará. (C. F. Baker.) One female.

Porto Velho, Rio Madeira. (Mann and Baker.) One male.

This striking species also has been recorded from Cayenne; Archidona, Ecuador; eastern Bolivia and Central America, in addition to the localities given above.

Posidippus citrifolius (Linnaeus)

1758. [*Gryllus* (*Tettigonia*)] *citrifolius* Linnaeus, Syst. Nat., ed. x, p. 429. ["Indiis."]

Porto Velho, Rio Madeira. (Mann and Baker; M. Bolton.) Two males.

For comments on this species see the recent paper by the author on *Posidippus* and allied genera.⁶

Anaulacomera⁷ albonodulosa Brunner

1891. *Anaulacomera albonodulosa* Brunner, Verhandl. K.-K. Zool.-botan. Gesell. Wien, xli, pp. 141, 145. [Upper Amazons.]

Pará, Pará. (C. F. Baker.) Three males, two females.

Piexe Boi, Pará. November to December, 1907. (Harriet B. Merrill.) One female.

⁵ The record by us of this species from Costa Rica (Proc. Acad. Nat. Sci. Phila., 1905, p. 807, (1906)), is incorrect, the specimen being, instead, *Peucestes dentatus*.

⁶ Entom. News, xxviii, p. 117, (1917).

⁷ In 1875, Scudder erected a genus *Anallomes* (Proc. Boston Soc. Nat. Hist., xvii, p. 261), based on two new species, *A. unipunctata* and *A. maranona*, both from the eastern slope of the Peruvian Andes. The former species was described from a unique male, the latter from a unique female, the two types now being before us. Both have been greatly battered in the course of time, and are greatly shrivelled and discolored, as they were dried from alcohol. The first species, *A. unipunctata*, is identical with *Phylloptera serva* Brunner (Monogr. der Phaneropt., p. 313, (1878)), described from Central Peru, while the second species, *A. maranona*, is an *Anaulacomera*, either identical with or extremely close to *A. nodulosa* Stål. Females of *Anaulacomera* without accompanying males are extremely difficult, if not impossible, to determine with certainty. Kirby (Synon. Catal. Orth., ii, p. 434, (1906)), has designated *maranona* as the genotype, which makes the genus a synonym of *Anaulacomera*, as the latter name has two years' priority over *Anallomes*.

The series before us fully agrees with the description of this species, to which it invariably runs in working over Brunner's key, except for two discrepancies. The subgenital plate of the male is described as triangularly emarginate, while in one male the margin is truncate, in another arcuate-emarginate, while the third has the margin abnormally compressed and not comparable. Other material of the species, now before us, does show this margin varying to subtriangularly emarginate. The margins of the ovipositor are described as "non crenulatis," which is true to the extent that they are more distinctly serrulate.

The species has not been recorded since the original description. Its produced, strongly incurved cerci of the male are quite distinctive as far as our acquaintance with the genus goes.

Anaulacomera angusta Brunner

1891. *Anaulacomera angusta* Brunner, Verhandl. K.-K. Zool.-botan. Gesell. Wien, xli, pp. 142, 147. [Upper Amazons.]

Pará, Pará. (C. F. Baker.) One male.

Not previously recorded aside from the original description.

Anaulacomera rusa new species (Plate III, figs. 8 and 9.)

Apparently allied to *A. harpago* Brunner, but differing in the femora having a few spines on their ventro-cephalic margins, in the cerci of the male being simply bifurcate distad, like the distal section of an antler of a deer of the genus *Rusa*, and in the bicarinate instead of tricarinate subgenital plate of the same sex. The supra-anal plate of the male is of the same elongate, greatly produced type said to occur in *harpago*. The form of the anal segment is so distorted from drying, the type having been in a liquid preservative, its exact form is hard to ascertain.

Type.—♂; Ceará-Mirim, State of Rio Grande do Norte, Brazil. (Stanford Expedition; W. M. Mann.) [Acad. Nat. Sci. Phila., Type no. 5305.]

Size small: form compressed. Head with the occiput and vertex moderately declivent: fastigium strongly compressed, very narrow distad, apex finely subglobose and almost touching the fastigium of the face; dorsal surface of the fastigium finely sulcate, the lateral margins roundly elevated proximad: fastigium of the face rather long acuminate, immediate apex narrowly rounded: face moderately inflated and bullate, subcompressed: eyes moderately prominent, very broad ovate in basal outline, this slightly flattened ventro-cephalad: antennae distinctly surpassing in length the closed tegmina and wings: palpi

very slender; fourth joint about three-fifths as long as the third joint; fifth joint over half again as long as the third joint, subclavate distad. Pronotum with the dorsum subdeplanate, narrow, the greatest caudal width contained one and two-thirds times in the greatest length of the same, lateral margins of the disk narrowly rounded and but very faintly converging cephalad; cephalic margin of disk subtruncate, caudal margin of disk moderately arcuate: lateral lobes of pronotum faintly longer than deep; cephalic margin of lobes shallowly arcuato-emarginate, ventro-cephalic angle obtuse, ventral margin obliquely arcuate, ventro-caudal angle broadly rounding into the oblique, broadly arcuate caudal margin; humeral sinus decided, rotundato-rectangulate. Tegmina elongate, lanceolate, surpassing the apices of the caudal femora by slightly more than the length of the pronotal disk, greatest width contained about five and one-half times in the greatest length; costal and sutural margins subparallel, the former briefly rounding distad to the rounded, but distinct, apex, which is practically median; sutural margin with a distinct distal arcuation to the apex: median vein diverging slightly proximad of the middle, bifurcate distinctly before its middle: areolation distinct and regular: tympanal field relatively small and rather narrow, the free margin rounded obtuse-angulate at the apex of the stridulating vein. Wings surpassing the closed tegmina by a distance equal to three-fourths of the length of the pronotal disk, the apex of the closed wings rounded acute. Prosternum with an elevated V-shaped structure, but no spines: mesosternal lobes rectangulate at the apices, the caudal margins well arcuate: metasternal lobes narrow, obtusely arcuate. Supra-anal plate elongate, linguiform trigonal, the distal portion very narrow, rounded at apex: cerci slightly longer than the pronotal disk, slender, subcompressed, antler-like; when seen from the dorsum arcuate laterad in proximal section, passing to weakly arcuate to the medial line distad, the form in this view caliper-like; when seen from the side regular arcuate, with the convexity ventrad, the ramus diverging on the ventral surface at distal third, and the same is as long as the distal third of the main shaft of the cercus, of similar shape and form, and with it making a V-shaped structure, the immediate apex of the ramus briefly sigmoid hamate: subgenital plate broad, distinctly bicarinate, the carinae moderately diverging distad; free margin arcuate-emarginate distad, with distinct, subacute and submammillate projections at the extremities of the carinae. Limbs slender: caudal femora moderately inflated proximad, slender distad, the ventro-lateral margin of the same with two to five spines.

Coloration destroyed by immersion in liquid preservative. Tympanal field of tegmina shows several areas of fuscous.

Length of body (exclusive of cerci), 11.8 mm.⁸; length of pronotum, 3.5; greatest (caudal) width of pronotal disk 2.1; length of tegmen, 21; greatest width of tegmen, 3.7; length of caudal femur, 13.3; length of cercus, 4.3.

The type is unique.

⁸ The body is much shrivelled and this measurement is undoubtedly less than the natural length.

Anaulacomera ovibos new species (Plate III, figs. 10, 11 and 12.)

Apparently not at all closely related to any of the previously known species of the genus, from all of which, excepting the following new species—*bovicula*, it differs in the extraordinarily recurved cerci of the male, these resembling in general form the horns of the musk-ox (*Ovibos moschatus*). The present species possesses other features which appear to mark it off, but the cercal characters are so distinctive for *ovibos* and the following species—*bovicula*, they alone need be cited to enable one to recognize the species. From *bovicula* the larger *ovibos* can be separated by the greater development of the cerci, which are greatly attenuated and recurved, recalling the horns of the musk-ox (*Ovibos moschatus*), the tips reaching dorsad almost to the base of the disto-dorsal abdominal segment. The genitalia of the two species are of essentially the same type, and no other important features of difference, but size, are evident, but the cerci of *bovicula* lack the extreme development found in *ovibos*.

The two species appear to belong in the section of the genus containing *A. intermedia* Brunner, with which they show affinity in the compressed fastigium, in the lateral lobes of the pronotum being longer than deep, in the presence of nodes along the humeral trunk in the proximal section of the discoidal field of the tegmina, and in all the femora being spinulose beneath.

Type.—♂; Baixa Verde, State of Rio Grande do Norte, Brazil. (Stanford Expedition; W. M. Mann.) [Acad. Nat. Sci. Phila., Type no. 5325.]

Size medium: form compressed: surface smooth, except for sparse and very minute points scattered irregularly over the body; tegmina coriaceous. Head with the occiput gently arcuate: fastigium compressed, faintly narrower proximad than distad, the apex concavo-truncate, dorsal surface with a deep medio-longitudinal sulcation, lateral margins of fastigium strumoso-carinate, these rectangularly diverging and vanishing caudad; fastigium of the face separated from the fastigium of the vertex by the very narrowest interval: eyes moderately prominent, sub-orbicular in basal outline: antennae (incomplete) at least as long as the body: palpi very slender; third joint one and two-thirds times as long as the fourth joint; fifth joint somewhat less than twice as long as the third joint, very faintly enlarged distad. Pronotum with the dorsum subdeplanate, subequal in width, the greatest caudal width contained nearly twice in the length: cephalic margin of disk very slightly angular-emarginate, caudal margin moderately arcuate; median figure rectangular, well impressed, caudal fourth of disk slightly depressed and somewhat different in texture from

the remainder; lateral portions of disk broadly rounding to the lateral lobes, appreciable but rounded shoulders present caudad, dorsad of the humeral sinus: lateral lobes faintly longer than deep; cephalic margin emarginato-truncate, ventro-cephalic angle obtuse, ventral margin oblique subtruncate, strongly descending ventro-caudad, ventro-caudal angle very broadly rounded, the whole caudal margin regularly arcuate to the subrectangulate humeral sinus. Tegmina surpassing the apices of the caudal femora by a distance slightly greater than the length of the pronotal disk, in form elongate lanceolate, the greatest width contained three and one-half times in the greatest length: costal margin regularly arcuate, except for a slight flattening in the distal half; apex well rounded; sutural margin moderately and regularly arcuate: marginal field with a number of rather regularly placed and directed, but irregularly branched and subobsolete, rami from the humeral vein; median vein diverging shortly distad of the middle, this furcate distinctly before its middle; ulner and median veins, their rami and cross-veins all sinuate and unstable in exact continuity; nodes paralleling the proximal half of the discoidal vein, four to five in number: stridulating field relatively small; stridulating vein strongly crassate, faintly arcuate, slightly oblique; free margin of field rounded obtuse-angulate at the apex of the stridulating vein. Wings surpassing the apices of the tegmina by a distance about equal to two-thirds the length of the pronotal disk: wing narrow, its greatest width contained about two and one-quarter times in the length of the same. Prosternum with a broad V-shaped structure: mesosternal lobes small, moderately arcuate laterad: metasternal lobes narrow, obtusely arcuato-truncate latero-caudad. Disto-dorsal abdominal segment deep, median section strongly deflexed ventrad between the cercal bases, terminating in a narrow, rounded protuberance, proximad from which extends a narrow and clearly defined sulcation; lateral sections of the same segment relatively broad, sub-lamellate, the ventro-distal angle subacute with the apex narrowly rounded: cerci quite elongate, cornuiform, rather thick at the base there with a short dorsal, arcuate carination; distad of the thickened base for a short distance they rather strongly and thence very regularly and gradually taper to the aciculate apex; the form, in general, is sharply falciform, being strongly arcuate in the proximal half, thence more gently but distinctly arcuate, their form considerably resembling that of the horns of the musk-ox; both faces (internal and external) of attenuate portion sulcate: subgenital plate short, broad at the base, strongly and regularly narrowing distad, the disto-median section of the margin narrowly arcuato-emarginate, this flanked by relatively short, fixed, styliform processes, lateral portions of the margin oblique truncate; surface of the plate with a medio-longitudinal carina and short, incomplete carinae at the bases of the styliform processes. Cephalic femora subequal in length to the pronotal disk, ventro-cephalic margin with five spines, ventro-caudal margin unarmed; median femora one and one-half times as long as the pronotal disk, ventro-cephalic margin with three spines distad, ventro-caudal margin unarmed. Caudal femora about three-fifths as long as the tegmen, moderately bullate proximad, very slender distad; ventro-external margin with four to five spines distad, ventro-internal margin with two to three distal spines.

Coloration completely destroyed by immersion in a liquid preservative, except for a short, velvety black line at the base of the anal vein, and several fuscous clouds on the stridulating field of the tegmina.

Length of body, 20.3 mm.; length of pronotum, 5.2; caudal width of pronotal disk, 3; length of tegmen, 28.2; greatest width of tegmen, 7.8; length of caudal femur, 17.

The type of this remarkable species is unique.

Anaulacomera bovicula new species (Plate III, figs. 13 and 14.)

The features separating this species from *A. ovibos*, its only close relative, which is described in the preceding pages, are given in the diagnosis of the latter species.

Type.—♂; Ceará Mirim, State of Rio Grande do Norte, Brazil. (Stanford Expedition; W. M. Mann.) [Acad. Nat. Sci. Phila., Type no. 5326.]

This species is in general such a duplicate of *ovibos* that the following descriptive features are solely those of difference from the description of *ovibos*.

Size rather small. Fastigii of the face and vertex separated by a somewhat greater space than in *ovibos*. Tegmina surpassing the apices of the caudal femora by nearly twice the length of the pronotal disk, in length about three and one-third times as long as the greatest width. Disto-dorsal abdominal segment in its position and development as in *ovibos*, but the median section bears a squared (in section), elevated portion, which narrows in width distad, with distinct lateral margins to the same area, which also bears a medio-longitudinal, shallow and relatively broad sulcus, strongly declivent lateral slopes and a truncate extremity; lateral portions of the segment as in *ovibos*; cerci of the general type found in *ovibos*, but the thickened proximal portion is less pronounced and more weakly carinate, while the attenuate portion is much less extensive, the tips reaching dorsad only to the cercal bases, sulcate as in *ovibos*; subgenital plate as in *ovibos*. Cephalic femora with three spines on the ventro-cephalic margin; median femora with one to two spines on the ventro-cephalic margin. Caudal femora with two to three spines on the ventro-external margin, ventro-internal margin with two to three spines.

Coloration destroyed by immersion in a liquid preservative, the same black and fuscous markings indicated as found in *ovibos*.

Length of body, 14 mm.; length of pronotum, 4.6; caudal width of pronotum, 2.7; length of tegmen, 24.2; greatest width of tegmen, 6.8; length of caudal femur, 14.

The type is unique.

In addition to the species of *Anaulacomera* here recorded, we have in the present series females of three other very distinct species, which we are unable to place in any of the forms known

at this writing. We do not care to describe species of this genus from the female sex alone, so it seems most advisable to permit these specimens to remain undetermined until males of the species are discovered.

***Grammadera hastata* Brunner**

1891. *Grammadera hastata* Brunner, Verhandl. K.-K. Zool.-botan. Gesell. Wien, xli, p. 150. [Cayenne.]

Porto Velho, Rio Madeira. (Mann and Baker.) One female.

This record and that by Giglio-Tos from Corumbá, Matto Grosso, Brazil,⁹ are the only ones for the species since the original description.

***Viadana granulosa* (Brunner)**

1891. *Ctenophlebia granulosa* Brunner, Verhandl. K.-K. Zool.-botan. Gesell. Wien, xli, p. 155. [Pebas, Upper Amazons (Peru).]

Pará, Pará. (C. F. Baker.) One male.

This specimen fully agrees with the ambisexual characters given by Brunner from the type female, and in proportions is identical, except for the caudal femora being slightly longer. The male genitalia fully agree with the description of those parts of *curvicercata* Brunner,¹⁰ except that the cerci are without any appendage at the basal fourth or any other point.

The range of the species is seen to cover a considerable portion of Amazonia.

***Phylloptera ancilla* (Brunner)**

1878. *Phylloptera ancilla* Brunner, Monogr. der Phaneropt., p. 312. [Surinam.]

Pará, Para. (C. F. Baker.) One female.

This striking species has, as far as we can ascertain, been recorded only from the type locality.

***Coelophyllum crassum* new species (Plate III, figs. 15 and 16.)**

Related to *C. rectinerve* (Brunner) [*Prosagoga rectinervis* Brunner], as understood by us, but differing in the more robust form, the body being much less compressed, and the eyes, fastigium, face, pronotum and stridulating field of the tegmina being

⁹ Bollett. Mus. Zool. Anat. Comp. Torino, xv, no. 377, p. 7, (1900).

¹⁰ Verhandl. K.-K. Zool.-botan. Gesell. Wien, xli, p. 155, (1891).

broad, the lateral lobes of the pronotum more decidedly narrowed ventrad, the tegmina proportionately broader and more coriaceous and opaque, in the marginal field of the tegmina proportionately narrower, the ramus of the median vein of the tegmina forking faintly proximad of the middle, in the ulnar vein of the tegmina being more bent arcuate and closer to the median vein, and in the median and caudal limbs being longer. From the related *C. curvinerve* (Brunner), from Fonteboa, Brazil, the new species apparently differs in the more numerous femoral spines, the longer and narrower pronotum and the longer caudal femora.

Type.—♂; Pará, State of Pará, Brazil. (C. F. Baker.) [Acad. Nat. Sci. Phila., Type no. 5309.]

Size medium: form moderately compressed (less than in allies), robust (for the genus): surface smooth but unpolished; tegmina with a slight polish. Head relatively broad, its greatest width subequal to the depth from occiput to ventral angle of genae: occiput weakly arcuate declivent to the fastigium, this narrow, acuminate with the apex narrowly rounded, sulcate, moderately declivent, widely separated from the fastigium of the face, the latter slightly acute-angulate: face slightly bullate, weakly impressed carino-rugose ventrad of the eyes, genae not prominent: eyes directed cephalad, not projecting laterad, their basal outline broadly subreniform-ovate, the cephalic trend of the convexity of the eye quite pronounced: antennae incomplete. Pronotum relatively broad, the dorsum distinctly deplanate: greatest dorsal (caudal) width of disk contained one and two-fifths times in the greatest length of the same; cephalic margin of disk distinctly but not strongly arcuate-emarginate: caudal margin of disk broadly and quite strongly arcuate; lateral angles of disk weakly diverging caudad, rounded, distinct except cephalad, where they are obsolescent; metazona with a distinct medio-longitudinal sulcus: lateral lobes of pronotum appreciably deeper than long, moderately narrowing ventrad; cephalic margin oblique subtruncate, ventro-cephalic angle rounded obtuse, ventral margin briefly oblique truncate, passing through the broadly rounded ventro-caudal angle into the slightly oblique, arcuate-truncate caudal margin, humeral sinus distinct but shallow, rotundato-rectangulate. Tegmina relatively broad, subrectangulate-elliptical, surpassing the apices of the caudal femora by the dorsal length of the head and pronotum combined, greatest width (median) contained two and one-half times in the greatest length, width at distal fourth contained slightly more than three times in the length: costal margin straight, except proximad, where it is obliquely truncate to the base, the two sections broadly rounding one into another, and distad where it is moderately arcuate to the rounded rectangulate apex, which is slightly costal in position; sutural margin arcuate except distad, where it is slightly flattened and arcuate into the obliquely arcuate-truncate apical margin: marginal field very broad proximad, regularly narrowing distad:

venation not sharply defined, the fine neuration lost in the close coriaceous areolation: marginal field at its widest portion subequal to one-half the entire width of the widest portion of the tegmina, with a number of oblique, sub-parallel rami of the humeral vein, these generally bifurcate and poorly defined; median vein diverging slightly before the middle of the tegmen, bifurcate distinctly before the middle of the vein, the rami reaching the suturo-apical arcuate portion of the margin; ulnar vein proximad close to the discoidal vein, slightly but appreciably converging to its point of furcation, thence oblique straight to the sutural margin, the median width of this area of convergence equal to one-third the greatest distance between the ulnar and anal veins: stridulating field relatively elongate, narrow, its free margin broadly arcuate, the stridulating vein heavy, depressed, arcuate. Wings normally not projecting distad of the closed tegmina. Prosternum unspined: mesosternal lobes slightly acute trigonal, the apices relatively sharp: metasternal lobes oblique, arcuate with a median truncation of the margin. Disto-dorsal abdominal segment broadly depressed medio-longitudinally, well arcuate in section dorsad of the insertion of the cerci; distal margin projecting and deflexed between the cercal bases in a process which is arcuato-emarginate mesad, with short, rounded angulations laterad, from each of which, as well as from the middle of the margin, fine sulcations extend to the median depression of the segment: supra-anal plate deflexed, in fact directed ventro-cephalad, elongate trigonal: cerci relatively short, moderately incurved with the apex bent slightly inwards, tapering, the apex subcompressed and bearing a short, dorsal, corneous ridge, which forms the acute apex: subgenital plate moderately compressed, somewhat elongate, the lateral margins regularly converging distad, distal margin relatively narrow, subtruncate; styles very short, conical, articulate. Cephalic femora relatively robust, short, not longer than the lateral angles of the pronotal disk; ventro-cephalic margin of same with several extremely weak serrulations distad, ventro-caudal margin unarmed: cephalic tibiae appreciably longer than the femora, quite slender in distal half; tympanum large, open on both faces: median femora faintly longer than the pronotal disk; ventro-cephalic margin with one to two serrulations distad. Caudal femora about one-half as long as the tegmina, moderately inflated proximad and tapering quite gradually to the moderately slender distal section: ventro-external margin with seven to ten spines; ventro-internal margin with one to four spines; caudal genicular lobes bispinose.

General color of head and pronotum honey yellow to yellow ochre, becoming mustard yellow on the other thoracic segments and the abdomen, the tegmina passing into sulphine yellow and finally (covering a variable portion distad) into lettuce green, the limbs yellow ochre to buckthorn brown. It is quite probable that shades of green were the normal color tones and that the present coloration is not that of life, but the specimen shows little discoloration and has not been immersed. Eyes russet. Pronotum with the lateral angles of the disk rather obscurely lined laterad with dull primuline yellow, and mesad narrowly with burnt lake, both faintly indicated in the postocular region of the head. Tegmina with numerous, very small specklings of liver brown, while

at the fork of the ulnar vein there is one large, and on the main branch of the same vein and on each ramus of the median vein, disposed with the curve of the sutural margin, three small blotches of the same color. Wings colorless hyaline with the veins pale yellowish.

Length of body, 22.7 mm.; length of pronotum, 6.2; greatest width (caudal) of pronotal disk, 4.6; length of tegmen, 30; greatest width of tegmen, 11; length of caudal femur, 15.5.

The type is the only specimen of the species we have seen.

Pycnopalpa bicordata (Serville)

1825. *Locusta bicordata* Serville, Encycl. Méthod., Ins., x, p. 343. [Brazil.]

Independencia, Parahyba. (Mann and Heath.) One male.

This specimen has the distal portion of the costal margin of the tegmina more regularly arcuate and less truncate than in Rio de Janeiro material.

Microcentrum lanceolatum (Burmeister)

1838. *Phylloptera lanceolata* Burmeister, Handb. der Entom., ii, abth. ii, pt. i, p. 692. [Brazil.]

Ceará Mirim, Rio Grande do Norte. (Mann and Heath.) One female.

This species has been recorded from localities extending from Guatemala and Surinam to southern Brazil.

Microcentrum marginatum Brunner¹¹

1878. *M[icrocentrum] marginatum* Brunner, Monogr. der Phaneropt., pp. 334, 336. [Pernambuco, Brazil.]

Ceará Mirim, Rio Grande do Norte. (W. M. Mann.) One female.

Independencia, Parahyba. (Mann and Heath.) One male.

The stridulating vein of the stridulating field of the male of this species is very heavy, long, strongly arcuate and with its paralleling vein but little inferior in development.

Microcentrum nigrolineatum (Bruner)

1915. *Orophus nigrolineatus* Bruner, Ann. Carneg. Mus., ix, p. 333. [Province of Sara, Bolivia.]

Pará, Pará. (C. F. Baker.) One male.

Chanchomayo, Peru. Two females.

¹¹ The specimen from Misiones, Argentina recently recorded by us as *M. angustum* (Proc. Acad. Nat. Sci. Phila., 1915, p. 288), we find, on re-examination and comparison with the present material, to represent *M. marginatum*.

This is a very clearly marked species, the striking peculiarities of its coloration greatly assisting in its ready recognition. It will be seen to have quite an extensive distribution.

PSEUDOPHYLLINAE

Lichenochrus variabilis Brunner

1895. *Lichenochrus variabilis* Brunner, Monogr. der Phaneropt., p. 128. [Pernambuco, Brazil; Columbia (err. pro Colombia).]

Ceará-Mirim, Rio Grande do Norte. (W. M. Mann.) Two males, one female.

Natal, Rio Grande do Norte. (W. M. Mann.) Two males, three females, one immature male.

Independencia, Parahyba. (Mann and Heath.) One male.

The greater portion of this material has been seriously affected by immersion in a liquid preservative. The coloration has been largely destroyed and nothing but the more decided contrasts of the pattern remain in the affected material, while the pronotal form apparently has been altered so greatly in some of the males, by the action of the preservative on the chitin, that on first examination a different species appears to be represented. There is, however, no question of the specific identity of the material. The size varies very considerably, the majority of the individuals being over, rather than under the original measurements. A striking feature, not mentioned by Brunner, is the paired lateral areas of shining brownish-black on the abdominal segment preceding the disto-dorsal one. There is a tendency in the same direction dorsad on the disto-dorsal segment of the male.

Teleutias tortus new species (Plate III, figs. 17 and 18.)

A small species related to *T. brevifolius* and *nigro-tarsatus* Brunner, from the upper Amazonian region, but differing from the former in the shorter tegmina in both sexes, and the shorter femora, the non-hirsute disto-dorsal abdominal segment of the male and the continuous character of the pronotal cariniform markings, which are as distinctly indicated on the metazona as on the metazona. From *nigro-tarsatus* the new form differs in the median femora having two or three spines on the ventro-cephalic margin, in the shorter cerci of the male, the non-incurved styles of the subgenital plate of the same sex and in the third tarsal joint not being black. From all the other species of the genus,

the new form apparently differs in the caudal genicular lobe of the cephalic femora and the cephalic genicular lobe of the median femora being rounded and unspined.

Type.—♂; Madeira-Mamoré Railroad Company Camp No. 39, Rio Madeira, Brazil. (Stanford Brazilian Expedition; Mann and Baker.) [Acad. Nat. Sci. Phila., Type no. 5320.]

Size small: form greatly compressed: surface of face obscurely punctulate, of pronotum granulose, of the entire body, except dorsum of abdomen, and of the tegmina more or less thickly pilose. Head with the fastigium not reaching to the margins of the antennal scrobes, this in form distinctly acute, sulcato-excavate distad, subtuberculate proximo-laterad, the apex slightly upcurved when seen from the side: eyes moderately prominent, short ovoid in basal outline: antennae greatly elongate, over two and one-half times as long as the body, proximal joint with a distinct spinous projection distad. Pronotum in general subcylindrical, faintly constricted mesad, faintly sellate, the greatest caudal width of the disk subequal to the cephalic width of the same and contained nearly twice in the length of the disk: cephalic margin of the disk weakly arcuate with a suggestion of a median tubercle; caudal margin of disk moderately arcuate with an intimation of a median emargination; lateral margins of the disk formed by weak sub-strumose ridges which are strikingly colored, these narrowing slightly cephalad, subparallel mesad and distinctly diverging over the greater portion of the metanotum: principal transverse sulcus placed slightly caudad of the middle, deeply impressed, continued ventrad over the whole of the lateral lobes; cephalic transverse sulcus equidistant from the cephalic margin and the principal sulcus, well impressed: lateral lobes distinctly longer than deep, the cephalic depth contained about twice in the greatest dorsal length of the lobes; ventral margin of the lobes slightly but appreciably ascending caudad; ventro-cephalic angle of lobes broadly rounded subrectangulate, ventro-caudal angle of lobes obtuse. Tegmina subcoriaceous, lanceolate, reaching to the apices of the caudal femora, the greatest width contained four and three-quarters times in the greatest length of the same: costal margin straight mesad, briefly arcuate proximad and distad; sutural margin straight; distal extremity narrowly rounded: stridulating field in length equal to about two-thirds that of the pronotum; mirror of the left tegmen translucent, of the right tegmen hyaline. Wings with their greatest width contained one and one-half times in their greatest length: costal margin nearly straight, apex narrowly rounded rectangulate, periphery regularly arcuate. Prosternal spines elongate: mesosternal lobes rounded rectangulate; metasternal lobes hardly produced, arcuate; metasternal foveolae slightly longitudinal. Disto-dorsal abdominal segment sinuato-arcuate distad, the distal half of the segment with an impressed median sulcus: supra-anal plate transverse trigonal, the surface slightly inflated and with a deeply impressed medio-longitudinal sulciform fossa, which fails to reach the somewhat rounded apex of the plate: cerci very short, inflated, bulbous in proximal portion, the apical section sharply reflexed, tapering, the immediate apex aciculate, directed

proximad in the direction of the base of the opposite cercus, pilose: subgenital plate short, broad, disto-mesad U-emarginate; styles but little shorter than the subgenital plate, elongate lanceolate, depressed, apex blunted, pilose. Cephalic femora subequal to the dorsal length of the head and pronotum together, armed on the ventro-cephalic margin with two spines on the distal half; cephalic genicular lobe spined, caudal one rounded; cephalic tibiae with the foramina compressed conchate. Median femora subequal to the cephalic femora in length, ventro-cephalic margin with three spines in distal half, cephalic genicular lobe rounded, caudal genicular lobe spined; median tibiae moderately compressed, weakly inflated proximad, dorsal margins unarmed. Caudal femora but slightly longer than the tegmina, moderately inflated proximad, ventro-cephalic margin with four to five spines, genicular lobes spined.

Allotype.—♀; Porto Velho, Rio Madeira, Brazil. (Stanford Brazilian Expedition; Mann and Baker.) [Acad. Nat. Sci. Phila.]

Differing from the description of the male sex in the following features. Size medium. Antennae nearly twice as long as the body. Pronotum less elongate, the greatest caudal width of the disk contained one and two-thirds times in the greatest length of the disk. Tegmina falling short of the apices of the caudal femora by about the depth of the lateral lobes of the pronotum, lanceolate, rather regularly narrowing from the proximal third, the greatest width contained four times in the greatest length of the same. Supra-anal plate of the pattern found in the male: cerci short, weakly curved, robust proximad, tapering distad: ovipositor two-thirds as long as the caudal femora, arcuate in distal three-fifths, proximal two-fifths straight and subequal in depth; ventral margin thence regularly arcuate, very faintly serrulate; dorsal margin in distal three-fifths arcuate emarginate, this section crenulate, particularly proximad: subgenital plate transverse, the free margin arcuate, rectangulate emarginate mesad. Caudal femora slightly shorter than the tegmina.

General color (specimens dried from liquid preservative) buckthorn brown to dresden brown, the dorsal surface of the abdominal segments mummy brown, the distal margin of these segments on the dorsum and for some distance ventro-laterad narrowly clove brown. Venter and face cream-buff to chamois, the lateral facial carinae, the lateral carinae of the pronotum, their cephalic continuation on the head and the sutural margin of the tegmina of both sexes, as well as the bordering of the stridulating field of the tegmina of the male, lineate with naples yellow, more pronounced in the male than in the female. Face with the pale markings more or less distinctly outlined with mummy brown, labrum with the distal half dull bluish; eyes russet; antennae with a few widely spaced, cream-colored annuli, which are thrown into contrast by the darkening of the adjacent section. Pronotum with the dorsal section of the lateral lobes marked with clove brown, this varying from a narrow line to a broader cloud and throwing the adjoining pale carinal line into contrast: cephalic margin weakly, and caudal margin strongly, beaded with clove

brown. Tegmina with the venation pale and contrasted with the buckthorn brown of the interspaces and reticulations, which to the naked eye appear as stipplings. Wings weakly smoke hyaline, the costal section, humeral trunk, median and axillary veins washed with ochraceous-orange to ochraceous-tawny, remaining longitudinal veins lined and transverse veins washed with fuscous. Limbs buckthorn brown to ochraceous-tawny, the femoral extremities occasionally washed with cinnamon-brown. Ovipositor with distal half chestnut.

Measurements (in millimeters)

♂	Length of body	Length of pronotum	Greatest width of pronotal disk	Length of tegmen	Greatest width of tegmen	Length of caudal femur	Length of ovipositor
Madeira-Mamoré							
R. R. Company							
Camp 39.							
Type.....	17.7 ¹²	5	2.7	17.4	3.8	14	
Paratype.....	19.4 ¹²	5	2.5	17.2	3.6	13	
♀							
Porto Velho, Brazil.							
Allotype.....	29	5.5	3	18.5	4.9	17.4	10.6

In addition to the type and allotype we have before us a paratype male from the type locality, this specimen being measured above. The three specimens show no noteworthy features of variation, excepting in the number of spines on the ventro-cephalic margins of the femora. Those on the cephalic femora range from one to three, on the median femora from two to three, and on the caudal femora from four to six.

COPIPHORINAE

Caulopsis gracilis Redtenbacher

1891. *Caulopsis gracilis* Redtenbacher, Verhandl. K.-K. Zool.-botan. Gesell. Wien, xli, p. 377, pl. iii, fig. 25. [Brazil; Buenos Aires; Montevideo; Rosario; Cuba.]

Amazon River, one hundred knots west of Santarem. Two females.

These specimens have lost all of their original coloration from alcoholic immersion, and are also distinctly shorter in body length than the originally measured material, but the individual parts agree very well in dimensions. The reduction of body length is doubtless due to shrinkage in drying, or the Redtenbacher material was abnormally distended.

¹² Body greatly bent.

The specimen from Misiones, Argentina, previously recorded by us as this species with a query,¹³ is different, representing instead *Neoconocephalus flavirostris* (Redtenbacher), described from São Paulo, Brazil.¹⁴ As a matter of fact the genera *Caulopsis* and *Neoconocephalus* approach dangerously close to one another, their differences being solely in degree, and *flavirostris* is not far removed from *gracilis*. Without material of the genotype of *Neoconocephalus* (*N. subulatus*), we do not care to express ourselves further on the features separating the two genera, but we hope to be able to make the desired comparison some time in the future.

Neoconocephalus xiphias (Saint Fargeau and Serville)

1825. *L[ocusta] xiphias* Saint Fargeau and Serville, Encycl. Méth., Ins., x, p. 342. [Cayenne.]

Pará, Pará. (Thayer Exped.) One male. [M. C. Z.]

Porto Velho, Rio Madeira. (Mann and Baker.) Four females.

Rio Pacaya, Peru. August, 1912. One male. [A. N. S. P.]

Two of the above females have retained their natural coloration, one greenish, the other brownish. There is some little variation in the exact attenuation of the distal extremity of the fastigium, but this is no greater than that found in most of the species of the group with produced fastigii.

We have not used *monoceros* of Stoll for this species, as done by Kirby, as we are uncertain of its application. From the figure it, with even more propriety, might be considered a *Copiphora*.

The present species has not been placed with certainty by any recent students of this group, but that it is closely related to *subulatus* (Bolivar) is evident. The only known record, aside from the type locality and those given above, is Santarem, Brazil (Walker).

Neoconocephalus heteropus (Bolivar)

1881. *Conocephalus heteropus* Bolivar, An. Soc. Españ. Hist. Nat., x, p. 496. [Itaparica, Bahia, Brazil.]

Independencia, Parahyba. (Mann and Heath.) Six males, three females.

All of these specimens have been dried after immersion in some liquid preservative, and in all the coloration has been injured,

¹³ Proc. Acad. Nat. Sci. Phila., 1913, p. 374, (1913).

¹⁴ Verhandl. K.-K. Zool.-botan. Gesell. Wien, xli, p. 386, (1891).

in several being almost completely destroyed. The extremes of both sexes in the series measure (in millimeters) as follows:

	Length of body	Length of pronotum	Greatest (caudal) width of pronotal disk	Length of tegmen	Length of caudal femur	Length of ovipositor
♂	27.2	7.4	4.5	37	21	
♂	27.4	8.1	4.9	41	23.5	
♀	29.2	7.5	4.5	47.2	26.7	28
♀	31.9	8	5.6	47	26.5	27.7

This species has been recorded from localities in eastern and southern Brazil, ranging from Parahyba to Espirito Santo (Lagoa Feia, Tocos; Bruner) and Corumbá, Matto Grosso (Giglio-Tos), west to Peru and Chile. The reference of West Indian material to this species by Redtenbacher and Brunner is, apparently, erroneous.

***Neoconocephalus infuscatus* (Scudder)**

1875. *Conocephalus infuscatus* Scudder, Proc. Boston Soc. Nat. Hist., xvii, p. 265. [Eastern slope of the Peruvian Andes.]

Porto Velho, Rio Madeira. (Mann and Baker.) One female.

We have been able to compare this specimen with the unique type (♀) of the species in the Scudder Collection at the Museum of Comparative Zoology. The two are inseparable except for the much greater depth, in the type, of the infuscation of the ventral surfaces of all the femora. The type has shrivelled somewhat from drying after liquid immersion, but otherwise the specific features are clear. The dorsal surface of the base of the abdomen, the left tegmen and wing being spread, has been damaged by insect pests.

Measurements (in millimeters) of the two specimens are as follows:

♀	Length of body	Length of pronotum	Greatest width of pronotal disk	Length of tegmen	Length of caudal femur	Length of ovipositor
Eastern slope of Peruvian Andes, <i>type</i>	29.5	7.7	5	43.8	26	23.8
Porto Velho, Brazil . . .	28.2	7.3	4.1	42.1	24.2	25.6

The species has been recorded from as far north as Cuba and St. Vincent, West Indies, south to southern Brazil (Theresopolis), west to Columbia, Ecuador, eastern Peru and Bolivia.

Bucrates capitatus (DeGeer)

1773. *Locusta capitata* DeGeer, Mém. Hist. Ins., iii, p. 455, pl. 40, fig. 1.
[Unknown locality.]

Amazon, one hundred knots west of Santarem. One male.

Pacaya, Peru. September, 1912. One male.

This well known species already has been recorded from as far inland in the Amazon valley as Santarem, but the Pacaya specimen is the first one reported from upper Amazonia.

Parabucrates brevicauda (Scudder)

1869. *Conocephalus brevicauda* Scudder, Proc. Boston Soc. Nat. Hist., xii, p. 333. [Napo River, upper Amazonia.]

1881. *Bucrates cocanus* Bolivar, Anales Soc. Españ. Hist. Nat., x, p. 495.
[Coca, Ecuador.]

Madeira-Mamoré Railroad Company Camp 39, Rio Madeira. (Mann and Baker.) One female.

Porto Velho, Rio Madeira. (Mann and Baker.) Three males, twelve females.

Porto Velho, Rio Madeira. (M. Bolton.) Two males, two females. [Cornell University.]

The synonymy of *Bucrates cocanus* with *brevicauda* is clearly evident from an examination of the material here studied, and from the original description of Bolivar's species. The name *cocanus* was based on the male sex, while the type and previously unique specimen of *brevicauda* is a female. This individual, belonging in the Scudder Collection at the Museum of Comparative Zoology, is now before us. It is in fairly good condition and measures as follows: length of body, 32 mm.; length of pronotum, 9.1; greatest caudal width of pronotal disk, 6.4; length of tegmen, 41.8; length of caudal femur, 22.5; length of ovipositor, 14. The series before us shows there is considerable variation in size in both sexes, but this is more pronounced in the male sex than in the female. Apparently all the specimens have been immersed in some liquid preservative, which has either destroyed or injured the general color tone, but in all the paired blackish pronotal lines are at least in part indicated. The black of the clypeal suture, on the internal portion of the mandibles, on the proximal antennal joints and on the ventral margins of the antennal scrobes is conspicuously and solidly indicated in all the specimens, except that the clypeal sutural marking occasionally weakens mesad.

This weakening is sometimes, but not invariably, associated with weakened paired pronotal lines.

The length of the tegmina is relatively uniform—surpassing the apices of the caudal femora by about the dorsal length of the pronotal disk—in all but one Porto Velho male, which has them but faintly surpassing the femoral tips. Such variation is known to occur in the related genus *Bucrates*, and it is a case of parallelism we find in the present genus.

The genus and species is known only from the upper Amazonian and Madeiran drainages.

LISTROSCELINAE

Phlugis mantispa Bolivar

1888. *Phlugis mantispa* Bolivar, Mém. Soc. Zool. France, i, p. 154. [Upper Amazonia.]

Ceará-Mirim, Rio Grande do Norte. (W. M. Mann.) Five males, one female.

Pará, Pará. (C. F. Baker.) One male.

Paramaribo, Surinam. (K. Mayo.) Six males.

The female specimen is somewhat smaller than the measurements of the unique type, but we can detect no other differences from the description. The species has been recorded from Mexico; Darien, Panama; La Guayra and Puerto Caballo, Venezuela; Cayenne; "Brazil"; Santarem and Urucum and Carandasinho, Matto Grosso, Brazil; Upper Amazonia; Porto Suarez, Bolivia; Asuncion, Paraguay and Formosa, Argentinian Chaco.

Phlugis virens (Thunberg)

1815. *C[onocephalus] virens* Thunberg, Mém. Acad. Imp. Sci. St. Petersburg, v, p. 274. [No locality.]

Ceará-Mirim, Rio Grande do Norte. (W. M. Mann.) One female.

Pará, Pará. (C. F. Baker.) Two females.

The previous Brazilian records of this widely distributed species are Rio de Janeiro, Pará and Chapada, Matto Grosso.

GRYLLIDAE

GRYLLOTALPINAE

Gryllotalpa hexadactyla¹⁵ Perty

1832. *Gryllotalpa hexadactyla* Perty, Delect. Anim. Artic. Brasil., p. 119, pl. 23, fig. 9. [Mountains of Minas Geraës, Brazil.]

Rio Ucayali, Peru. Two females.

Rio Pacaya, Peru. July, 1912. Two females.

We record these specimens here chiefly as a reason for calling attention to a structural variation in the species. The dorso-internal margin of the caudal tibiae is normally unarmed in this species, but in one of the specimens from the Rio Ucayali, this margin on one limb bears a single median spine and on the other bears two spines. We have also examined a specimen from Bartica, British Guiana, which bears a single spine in this position on one caudal femur, while the other femur is unspined. A similar condition exists in seven specimens in the North American series of the species in the collection of the Academy,¹⁶ while one female in the same series has a single spine on this margin of each femur.¹⁷ Chopard has named this spined condition, variety *spinosa*,¹⁸ but the evidence we have shows the futility of applying names to such variants. We also find, from the available series from North, Central and South America, that the presence of the paired rows of incurved chaetiform hairs on the disto-dorsal abdominal segment is correlated, in this species, with the development of the wings, the hairs being absent in short-winged individuals, faintly developed in those with a briefly caudate wing development, and well developed in those having fully caudate wings.

¹⁵ We cannot consider *Neocurtilla* Kirby a distinct genus from *Gryllotalpa*, as variation in *G. hexadactyla* makes its definition on the basis of the spination of the dorso-internal margin of the caudal femora impossible. The frequent use of the name *Curtilla* in place of the far older *Gryllotalpa* as the generic name, is reprehensible, as nomenclatural tautonomy is not only a rather desirable thing, but has been sanctioned by the International Zoological Commission on Nomenclature in the matter of type fixation.

¹⁶ Edge Hill, Penna.; X, 4, 1906; (W. Stone); 1 ♂: Collingdale, Penna.; V, 19, 1902, (P. Laurelliere); 1 ♀: Gladwyn, Penna., VI, 7, 1908; (S. G. Dixon); 1 ♀: Atlanta, Georgia; VIII, 28, 1912; 1 ♀: Excelsior Springs, Missouri; 1 ♀: Douglas County, Kansas; 1 ♂, 1 ♀.

¹⁷ Tuckerton, New Jersey, IX, 1907, (F. Austin), 1 ♀.

¹⁸ Ann. Soc. Entom. France, 1912, p. 401, (1912).

Gryllotalpa intermedia Saussure

1874. *Gryllotalpa intermedia* Saussure, Miss. Sci. Mexiq., Rech. Zool., vi, pp. 341, 345. [Hot lands of the Gulf Coast of Mexico; Central America.]

Manaos, Amazonas. (Mann and Baker.) One male.

Concha Huaya, Rio Ucayali, Peru. January 7 to 10, 1913.
Two females.

Contamano, Rio Ucayali, Peru. October to December, 1912.
Five males, seven females.

Rio Pacaya, Peru. July, 1912. Seven males, five females.

The series referred to *intermedia* fully agrees with the brief original description and the line or so of additional information given later by the original author. We have been able to study a single male of this species from Port Limon, Costa Rica, from the collection of the United States National Museum (Fred. Knab), and, aside from the features here mentioned, the Amazonian series agrees with the Costa Rican specimen. The latter is smaller than the majority of the Brazilian or Peruvian material, being very close to the original measurements, while the wings are briefly caudate, just reaching to the base of the disto-dorsal abdominal segment. All the present South American series are elongate caudate in wing development, these much surpassing the apex of the abdomen, while the ocelli are much smaller, proportionately as well as relatively, in the Port Limon individual than in the others. The wing length features are clearly as individual in this species as the same conditions are in *G. hexadactyla* and other species of this subfamily, while the ocellar size difference is probably geographic or has a physiologic correlation, similar variation being known in *hexadactyla*. The specimens before us show that the development of the double series of chaetiform hairs on the disto-dorsal abdominal segments is correlated, as mentioned above under *hexadactyla*, with the wing length. The relatively short-winged Port Limon specimen has these sub-obsolete, while the remaining long-winged individuals have them distinctly developed.

The species is distinctly smaller and more slender than *hexadactyla*, with shorter digits on the cephalic tibiae. The form shows considerable individual size variation, which is not sex correlated, although the very smallest individuals seen are males. However, some of the largest specimens are also males, while certain females

are quite small. The smallest and one of the largest specimens from Contamano, as well as the Port Limon individual, measure (in millimeters) as follows:

	Length of body	Length of pronotum	Greatest width of pronotum	Length of tegmen	Length of wing distad of tegmen	Length of caudal femur
♂ Port Limon, Costa Rica .	19	6.2	4.5	7	3.6	5.2
♂ Contamano, Peru	19.1	5.1	4	7.3	11.8	4.8
♀ Contamano, Peru	25.4	6.7	5.1	9	13.5	6.4

In none of the present series do the tegmina reach to the apices of the caudal femora. As far as the present relatively extensive series is concerned, we find no tendency toward the spination of the dorso-internal margin of the caudal tibiae, such as has been noted in *G. hexadactyla*.

GRYLLOTALPELLA new genus

Related to *Gryllotalpa* Latreille, from which it can be readily distinguished by the auditory foramina of the cephalic tibiae being open and sub-reniform, while in *Gryllotalpa* they are rimate, occasionally the slit having a slight overhanging and covering projection. In *Gryllotalpella* the ventro-caudal margin of the cephalic femora are unexpanded and simple, while in *Gryllotalpa* this margin is lamellate expanded. The tegminal venation of *Gryllotalpella* is much more simple, with almost no proximal cross-veins, than in *Gryllotalpa*, which has numerous cross-veins in the same section. The form in *Gryllotalpella* is also much more slender and the size smaller than in the species of *Gryllotalpa*.

Generic Characters—Form slender, its general development Gryllotalpoid. Head narrow; eyes large, closely placed. Pronotum sub-rhombiform, greatest width cephalad of the middle. Tegmina with venation showing few cross-veins, these largely distad; marginal field with reduced proximal section. Cephalic femora with ventral margins carinate, non-lamellate; trochanteral process distinct, trigonal; cephalic tibiae with auditory foramina exposed, subreniform, with margins cingulate and membrane complete; digits four in number; cephalic metatarsi as in *Gryllotalpa*. Caudal tibiae armed at apex with six spines.¹⁹

¹⁹ If *Gryllotalpa macilentia* Saussure is found to be a member of this genus, as appears quite probable, this sentence will require modification, as it is said to have but four spines in this position.

Genotype: *Gryllotalpa minor* Bruner.

The genus probably includes *Gryllotalpa macilenta* Saussure,²⁰ from Surinam, but no material is available for comparison. Its general form, however, is close to that of the genotype of *Gryllotalpella*, and the general form of the cephalic femora is figured as similar.

Gryllotalpella minor (Bruner)

1916. *Gryllotalpa minor* Bruner, Ann. Carneg. Mus., x, pp. 349, 350. ["Between the farm Berlin and Guaja Mirim," Rio Mamoré, Bolivia.]

Manaos, Amazonas. (Mann and Baker.) One female.

This specimen is slightly larger than the type and has distinctly longer tegmina and fully developed caudate wings, which surpass the apex of the abdomen by more than half of the pronotal length. The measurements (in millimeters) are as follows: length of body, 19.6; length of pronotum, 6; greatest width of pronotum, 4.2; length of tegmen, 8.1; length of wings distad of tegmina, 11.1; length of caudal femur, 4.5.

Scapteriscus oxydactyla (Perty)

1832. *Gryllotalpa oxydactyla* Perty, Delect. Anim. Artic. Brasil., p. 118, pl. 23, fig. 7. [Interior of Minas Geraës, Brazil.]

Rio Madeira, five hundred miles from mouth. (Mann and Baker.) Two females, twenty-one immature specimens.

Upper Beni River, Bolivia. (Dr. Heath, through E. D. Cope.) One male.

Contamano, Rio Ucayali, Peru. October to December, 1912. One female.

The immature specimens represent at least three instars preceding maturity and in all the distinctive color pattern of the species is clearly indicated. These undeveloped individuals also show the progressive production of the dorsal thickening of the cephalic tibiae into a decurved lamellation, which in the mature condition and preceding instar cover over the auditory foramina, which in the least developed specimen are almost completely exposed reniform tympana.

The range of the species extends from at least as far north as the Amazon Valley, south to Rosario, Argentina (Bruner), and from Rio Grande do Sul and Minas Geraës, west to the upper reaches of the Amazonian system in Peru (Contamano) and Bolivia (upper Beni).

²⁰ Miss. Scient. Mexiq., Rech. Zool., vi, p. 343, pl. viii, figs. 23, 23a, (1874).

Scapteriscus tenuis Scudder

1869. *Scapteriscus tenuis* Scudder, Mem. Peabody Acad. Sci., i, pp. 7 and 8, pl. i, fig. 7. [Puty, State of Piahy, Brazil.]

Pará, Pará. (C. F. Baker.) One female.

Pará, Pará. (W. M. Mann.) One female.

Ceará, Ceará. (W. M. Mann.) One male.

Natal, Rio Grande do Norte. (W. M. Mann.) One immature specimen.

Baixa Verde, Rio Grande do Norte. (W. M. Mann.) Two immature specimens.

Independencia, Rio Grande do Norte. (Mann and Heath.) One male, five females.

The literature furnishes us with but slight information regarding this interesting little species, which as far as known occurs only in northeastern Brazil, the most eastern (Natal) and most western (Pará) records being given above. The form of the trochanter and the position of the dactyls, combined with the rather pronounced coloration, are distinctive features of the species. The present series of adults are equal to or very slightly larger than the original measurements, and in the same the wings are invariably caudate, appreciably surpassing the apex of the abdomen.

Scapteriscus borellii Giglio-Tos

1894. *S[capteriscus] borellii* Giglio-Tos, Boll. Mus. Zool. Anat. Comp. Torino, ix, no. 184, p. 45, pl. figs. 12 and 15. [Colonia Risso, Rio Apa, Paraguay.]

Ceará, Ceará. (W. M. Mann.) One male.

Natal, Rio Grande do Norte. (W. M. Mann.) Two males.

Independencia, Parahyba. (Mann and Heath.) One female.

The occurrence of this species in northeastern Brazil is, to say the least, rather surprising, but comparisons of the present material with the original description, and material of both sexes from Argentina (Jujuy, Chacras de Coria and Mendoza), show the Brazilian specimens to be inseparable from the more austral individuals. No previous records from localities to the northeast of the Misiones, Argentina and the Rio Apa, Paraguay, were known.

This species is closely related to *S. mexicanus* (Burmeister) and *acletus* Rehn and Hebard, while *tenuis* is, in general, more nearly

allied to *oxydactyla* (Perty) and *camerani* Giglio-Tos a closer relative of *didactylus* (Latreille).

***Scapteriscus camerani* Giglio-Tos**

1894. *Scapteriscus camerani* Giglio-Tos, Boll. Mus. Zool. Anat. Comp. Torino, ix, no. 184, p. 45. [Province of San Pedro and Asuncion, Paraguay.]

Rio Madeira, five hundred miles from mouth. (Mann and Baker.) One male.

Amazon, one hundred knots west of Santarem. (Mann and Baker.) Two males, two females.

These specimens have been carefully compared with a male of this species from Buenos Aires, Argentina, previously reported by us,²¹ and we find they represent the same species. It is a close relative of *didactylus*, but can be distinguished with ease by its broader and shorter head, which has the eyes slightly less prominent, and by the broader pronotum, the caudal margin of which is more broadly rounded and less produced arcuate. The character of the trochanterial process also assists in the determination, but the head form is the most striking feature.

The species has been recorded from Gualaquiza and Valle del Santiago, eastern Ecuador, and it is quite evident from the records now known that its distribution is quite extensive, covering at least a considerable portion of the upper and middle Amazonian regions, in addition to reaching as far to the south as Buenos Aires.

***Scapteriscus vicinus* Scudder**

1869. *Scapteriscus vicinus* Scudder, Mem. Peabody Acad. Sci., i, pp. 7 and 12, pl. i, figs. 4 and 23. [Rio Negro; Piahy and Pará, Brazil; Panama; Rio Grande (Brazil?); Asia?]

Quibdo, Cauca, Colombia. September, 1896. One female.

Caicara, Venezuela. July 9, 1907. (G. K. Cherrie.) Six males, seven females. [A. N. S. P. and Hebard Cln.]

Rio Pacaya, Peru. July, 1912. One female.

We have been able to compare these specimens with the single male from Rio Negro (received from P. R. Uhler) which stands at the head of the list of specimens in the original description, and which is here selected as the lectotype. This individual demonstrates that Rehn and Hebard have correctly interpreted the species in their study of material from North America.

²¹ Proc. Acad. Nat. Sci. Phila., 1915, p. 289, (1915).

The species is now known to range as far south as Las Palmas, Chaco, Argentina and Santa Cruz de la Sierra and Puerto Suarez, Bolivia, west to the Rio Pacaya, Peru, east to Piauh, Brazil and north to Colombia and Venezuela, and through the West Indies, occurring also in eastern Georgia.

***Tridactylus apicalis* Say**

1825. *T[ridactylus] apicalis* Say, Journ. Acad. Nat. Sci. Phila., iv, p. 310. ["St. John's River, in east Florida and on the Missouri, as far as Council Bluff."]

Igarapé-assú, Pará. (H. S. Parish.) One female.

Rio Madeira, five hundred miles from mouth. (Mann and Heath.) Twelve males, ten females, seven immature males, one immature female.

These specimens have been the object of a considerable amount of comparison and tabulation, with consideration from different view-points of the problems they present. The conclusions reached are best presented serially. The first important point is that the Igarapé-assú female is absolutely indistinguishable from average North American specimens of that sex. The next is that the Rio Madeira series, which has been dried from alcohol and consequently has its coloration affected and doubtless has shrivelled to a certain degree, as a whole is appreciably smaller than North American specimens of the species. The third is that the metatarsi of the caudal limbs average longer, in proportion to the principal spurs, in the Rio Madeira individuals than in North American specimens. The fourth, instability in genital features, generally used diagnostically, is proven by the series now available for study.

We will discuss the last three of these conclusions as briefly as possible. Relative to size, it is evident from the examination of series from North American localities that size variation is decided. It is known to be individual and probably is, to a certain degree, geographic. The present Rio Madeira series was doubtless taken in a circumscribed area and the individuals were in all probability subject to identical control influences. These specimens have also been dried from alcohol, a process almost invariably productive of some shrinkage. The Igarapé-assú female is of similar size to the average of North American material.

Examination of a considerable number of specimens from both Americas shows the larger distal tibial spurs and the metatarsus of the caudal tarsi vary in length, relatively as well as actually.²² We find in an extensive series from Spring Creek, Georgia, and a smaller lot from West Point, Nebraska, that the spurs range from equal to slightly longer than the metatarsus, while in the Rio Madeira material the spurs average faintly shorter than the metatarsus. We have seen one North American specimen²³ with the spurs shorter than the metatarsus. Shrivelling may have exaggerated the shortness of the spurs in the Rio Madeira specimens, as they show the pull of drying by having a somewhat arcuate form. Relative to the form of the free margin of the ultimate and penultimate ventral abdominal segments of both sexes, we find most decided variation. In the male sex the more usual type in North American specimens has the penultimate segment with a straight margin, the ultimate very faintly and shallowly arcuato-emarginate; from this type we find modifications with the penultimate segment having the margin flattened arcuate to very shallowly concave, the ultimate more deeply concave to almost truncate. The same sex in the Rio Madeira specimens always has the penultimate segment with a more or less arcuate margin, and the ultimate segment ranging from no more concavo-emarginate than in Spring Creek males, to deeply arcuato-emarginate, in fact sub-bilobate, with the lateral portions of the segment subcompressed. This latter condition is apparently due to the drying from alcohol, the degree of which it is almost impossible to correctly estimate. In the female sex the penultimate segment has the margin, in the Spring Creek series, varying from subtruncate with the faintest sort of nick mesad, to broadly and shallowly obtuse-angulate emarginate (more usual), while the ultimate segment has the margin truncate or truncate with a minute indentation, to faintly concave (more usual). The Rio Madeira females, from having the extreme type with a broad truncate emargination of the penultimate

²² One male from West Point, Nebraska, in the Hebard Collection, has the metatarsi of the caudal limbs aborted, being represented by mere excrescences, such as found in the related genus *Ellipes*.

²³ Maryland; one male; (A. N. S. P.).

segment and a regularly arcuato-truncate ultimate segment, range to types as described from the Spring Creek representation.

It is evident from these summaries that the size difference is not of specific value, while the proportion of spurs and metatarsus is variable, and the form of the margins of the penultimate and ultimate ventral abdominal segments not of specific diagnostic value in the present instance.

In coloration all the Rio Madeira specimens are of the pale type, but this is certainly due in large part to the action of alcohol. The Igarapé-assú female is a relatively dark specimen.

Of the four species of the genus recently described by Bruner from South America,²⁴ the Rio Madeira material shows some approach to his *atratus*, but we cannot consider this as distinct from *apicalis* after the examinations we have made, nor can we make *atratus* synonymous without more data than that contained in the description.

Brunner²⁵ has recorded this species from Buenos Aires and the Misiones, Argentina, Giglio-Tos²⁶ reported it, with a query, as the synonymous *mixtus* from Urucum, southern Matto Grosso, Brazil, while Scudder has quoted Bolivar as reporting it from Ecuador.

***Ellipes minuta* Scudder**

1862. *T[ridactylus] minutus* Scudder, Boston Journ. Nat. Hist., vii, p. 425. [Southern Illinois.]

Pará, Pará. (C. F. Baker.) One female.

²⁴ It is most unfortunate at this date, and in the state of our knowledge of the instability of the features of the cephalic tibiae in this genus, and also of the tone of coloration, which any large series shows to be unimportant, to find "new" species based largely on these features. In the Gryllidae, more so than in any other group of Orthoptera, it is of the utmost importance for the describer to secure a proper conception of variation within species, and also to keep in close touch with the recent quantitative and variational studies of the group treated. This does not seem to have been done in Bruner's paper on South American Crickets (Ann. Carneg. Mus., x, pp. 344 to 428, (1916)), as considerable of the recent work on the genera *Nemobius*, *Gryllus*, *Miogryllus*, *Neoxabea*, *Cyrtoxipha* and *Anaxipha* has been overlooked or disregarded, while morphological features, such as the perforation of the cephalic tibiae in *Miogryllus*, *Gryllodes*, *Anaxipha* and *Cyrtoxipha*, which have been tested out and found wanting as diagnostic specific characters, still appear as of prime importance.

²⁵ Ann. Mus. Civ. Stor. Nat. Genova, xxxiii, p. 195, (1893).

²⁶ Bollett. Mus. Zool. Anat. Comp. Torino, xv, no. 377, p. 8, (1900).

This specimen is inseparable from material from the United States. We also have specimens (three males) from as far south as Mendoza, Province of Mendoza, Argentina (Haarup), in the collection of the Academy. The species is seen to have a very great distributional range, being in the class with *Gryllus assimilis* and *Miogryllus verticalis*.²⁷ The Pará and Mendoza specimens are all macropterous.

Rhipipteryx pulicaria Saussure

1896. *Rhipipteryx pulicaria* Saussure, Biol. Cent.-Amer., Orth., i, p. 215, pl. xi, fig. 24. [Dos Caminos, Guerrero; Atoyac, Vera Cruz and Teapa, Tabasco, Mexico.]

Pará, Pará. (C. F. Baker.) One female.

We have compared this specimen with material from Belize, British Honduras (one male), San Marcos, Nicaragua (one female) and Trinidad (two males), in the collection of the Academy, and find them to be specifically inseparable. As Bruner has stated²⁸ there is quite a wide range of variation in specimens, so far as color is concerned and to a certain degree in size. The antennal coloration is one of the markedly variable features, and in the Pará specimen the antennae are fuscous, with the proximal segments marked dorsad and the median segments disto-dorsad with yellowish.

The species has been recorded from as far south as Corumbá, Matto Grosso, and Jacoré, Minas Geraës, Brazil, and Puerto Suarez, Bolivia, west to Tarma, Peru, east to Trinidad and French Guiana (Nouveau-Chantier).

Rhipipteryx trilobata Saussure

1874. *Rhipipteryx trilobata* Saussure, Miss. Scient. Mexiq., Rech. Zool., vi, p. 357. [Guiana.]

Pará, Pará. (W. M. Mann.) Two males.

Porto Velho, Rio Madeira. (Mann and Baker.) One female.

²⁷ Bruner (Ann. Carneg. Mus., x, p. 359, (1916)) has continued to use *histrion* and *histrionicus* Saussure as valid specific names, although they were synonymized under *minuta* by Scudder as long ago as 1902 (Psyche, ix, p. 308). Rehn and Hebard recently have made some remarks (Proc. Acad. Nat. Sci. Phila., 1916, p. 284, (1916)) concerning the variability of *minuta*, chiefly in reference to the presence or absence of subapical natatory lamellae on the dorsal margins of the caudal tibiae.

²⁸ Ann. Carneg. Mus., x, p. 367, (1916).

These specimens are inseparable from a male of the species from Demerara. Bruner has recorded the species from Pará, and Chopard reported it from St. Jean du Maroni and Nouveau-Chantier, French Guiana, but the distribution is considerably extended by the Porto Velho individual.

GRYLLINAE

Hemigryllus ortonii (Scudder)

1869. *Nemobius ortonii* Scudder, Proc. Boston Soc. Nat. Hist., xii, p. 330.

[Napo or Marañon (Rivers).]

1877. *H[emigryllus] kreichbaumeri* Saussure, Mélang. Orthopt., ii, fasc. v, p. 268, pl. 12, fig. viii. [Brazil.]

Independencia, Parahyba. (Mann and Heath.) One female.

Itacoatiara, Amazonas. (Mann and Baker.) One female.

Rio Madeira, five hundred miles from mouth. (Mann and Baker.) Two males, four females.

Madeira-Mamoré Railroad Camp 39, Rio Madeira. (Mann and Baker.) One male.

Madeira-Mamoré Railroad Camp 41, Rio Madeira. (Mann and Baker.) One male.

We have now before us the unique female type of Scudder's *Nemobius ortonii*, which represents the insect on which Saussure eight years later erected the genus and species *Hemigryllus kreichbaumeri*. The type is somewhat discolored and considerably shrivelled and distorted, but the synonymy of the two names is beyond question.

The Independencia specimen is distinctly paler than any of the other individuals of the species here recorded, the darker pattern being weaker, more broken and less continuous, as well as the ground color paler, than in the other more intensively colored specimens. The Madeira series shows some variation in size, but not sufficient to cause any difficulty in the recognition of the species.

The species has been recorded from as far south as Santa Rosa, Province of Salta, Argentina (Giglio-Tos), east to Independencia, Parahyba, Brazil, west to the Rio Napo, Ecuador (Bolivar).

Anurogryllus muticus (DeGeer)²⁹

1773. *Gryllus muticus* DeGeer, Mém. Hist. Ins., iii, p. 520, pl. 43, fig. 2. [Surinam.]

Independencia, Parahyba. (Mann and Heath.) Three females.

These specimens have been compared with two topotypic females (Paramaribo, Surinam; K. Mayo), in the collection of the Academy, and no differences worthy of mention seen.

The species is widely distributed in South America, extending south to Argentina and west to eastern Peru and Ecuador, reaching as high as five thousand feet elevation in Peru (Huadquina; Caudell).

Miogryllus convolutus (Johannson)

1763. *Gryllus convolutus* Johannson, Amoen. Acad., vi, p. 399. [Surinam.]

Manaos, Amazonas. (Mann and Baker.) Two males.

Porto Velho, Rio Madeira. (Mann and Baker.) One male.

These specimens have been recorded by Hebard in his study of the genus.³⁰

Miogryllus verticalis (Serville)³¹

1839. *Gryllus verticalis* Serville, Hist. Nat. Ins., Orth., p. 343. [Cayenne.]

Baturite Mountains, Ceará. (W. M. Mann.) One male.

Maranguape Mountains, Ceará. (W. M. Mann.) One male.

Independencia, Parahyba. (Mann and Heath.) One male, one female.

These specimens have been recorded by Hebard in a study of the genus.³²

Gryllus assimilis (Fabricius)

1775. [*Acheta*] *assimilis* Fabricius, Syst. Entom., p. 280. [Jamaica.]

Ceará, Ceará. (W. M. Mann.) One male, one female.

Natal, Rio Grande do Norte. (W. M. Mann.) One female.

²⁹ Rehn and Hebard (Proc. Acad. Nat. Sci. Phila., 1916, pp. 291 and 292, (1916)) have made important critical notes on the synonymy of this species.

³⁰ Journ. N. Y. Entom. Soc., xxiii, pp. 109 to 110, (1915).

³¹ There can be little question but that Bruner's recently described *Gryllodes macropterus*, based on a single male from the State of Bahia, Brazil, and *Gryllodes argentinus*, described from four specimens from Carcaraña, Argentina, were founded on macropterous individuals of this very variable and widely distributed species. For comments on this genus and species, see Hebard (Journ. N. Y. Entom. Soc., xxiii, pp. 101 to 121, (1915)).

³² Journ. N. Y. Entom. Soc., xxiii, p. 121, (1915).

Independencia, Parahyba. (Mann and Heath.) Three males.

For critical comments on this very plastic and widely ranging species see Rehn and Hebard's recent paper on the American *Gryllus*.³³

The descriptive symbols proposed by the above authors, would read for these specimens as follows: Ceará; ♂, D Y e x 4; ♀, C D? e v O 3. Natal: ♀, C D Y e v 3. Independencia: ♂, A X c x O 3; ♂, A W a x O 3; ♂, A X c v O 3. The Ceará and Natal specimens have distinct head stripes and apparently show in all a response to the subarid character of the region.

OECANTHINAE

Paragryllus temulentus Saussure

1878. *P[aragryllus] temulentus* Saussure, Mélang. Orthopt., II, fasc. vi, p. 553. [Brazil.]

Porto Velho, Rio Madeira. (Mann and Baker.) One female.

We have examined, with this specimen, two males from Bartica, British Guiana (XII, 12, 1912; H. S. Parish), in the collection of the Academy. It seems probable that the Central American material referred to this species by Saussure, in 1897,³⁴ represented a different species from the type, which had passed out of his hands before that time. At all events the present material accords better with his original description than it does with his later one, based on Central American specimens.

Oecanthus tenuis Walker

1869. *Oecanthus tenuis* Walker, Catal. Derm. Salt. Brit. Mus., p. 95. [Santarem, Brazil.]

Independencia, Parahyba. (Mann and Heath.). Two females.

These specimens are referred to *tenuis*, although the eyes are not piceous, as described. The material in hand, however, has been strongly decolored by immersion in a liquid preservative, and the present coloration of the eyes is the greenish white of the whole insect. The proximal and second antennal joints are finely lineolate with black on their ventral face, that of the proximal joint occasionally broken mesad, and that of the second joint faintly arcuate. The proximal joint is distinctly bullate on the ventro-internal face.

³³ Proc. Acad. Nat. Sci. Phila., 1915, pp. 293 to 322, pl. iv, (1915).

³⁴ Biol. Cent.-Amer., Orth., I, p. 242, pl. xii, figs. 2 to 7.

Oecanthus pictipes new species (Plate III, figs. 19, 20 and 21.)

A very striking and distinct species of the genus, which differs, at least from all the previously known American forms, in the distinctly and rather closely punctulate limbs, the annulate antennae and the paired dark postocular lines on the head, while the small size, the structure and pattern of the two proximal antennal segments, the short and broad pronotum and the greatly aborted wings will assist in the recognition of the species.

Type.—♂; Natal, State of Rio Grande do Norte, Brazil. (Stanford Brazilian Expedition; W. M. Mann.) [Acad. Nat. Sci. Phila., Type no. 5330.]

Size very small: form as usual in the genus. Head moderately elongate, subdepressed; interocular region with an impressed, transverse, obtuse-angulate sulcation, the arms of the angle weakly arcuate; inter-antennal section moderately elongate, subequal in width, moderately bullate: palpi with the third and fourth joint subequal in length, the fifth joint longer than either of these, slender, cylindrico-fusiform: eyes moderately prominent, acute pyriform in basal outline: antennae with the proximal joint relative large, subdepressed, internal face with a distinct bulbous swelling. Pronotum relatively short, the greatest length but slightly greater than the caudal width, when seen from the side the dorsal line is straight; the disk broadly rounds laterad into the lateral lobes; cephalic margin of the disk moderately arcuate, caudal margin of same bisinuate-truncate: surface of the disk smooth cephalad, in caudal half with a distinct, but short, medio-longitudinal impression, laterad of which are faintly more decided, equally long, but arcuate impressions, the curve of the arcuation laterad; when seen from the dorsum the pronotum is appreciably constricted very shortly cephalad of the caudal margin: lateral lobes of the pronotum distinctly longer than deep, the greatest depth at the caudal third, near which point the pinching-in of the lobes is most decided; ventro-cephalic angle of the lobe hardly indicated, broadly arcuate-obtuse; ventral margin oblique, regularly arcuate; ventro-caudal angle broadly rounded rectangulate. Tegmina of medium width, the greatest breadth of the dorsal field contained about twice in the greatest length of the same: lateral field broad, strongly reflexed ventro-mesad, the greatest width of the field at the distal third; costal margin in general straight except for very brief proximal and much more extensive distal arcuations; mediastine vein with eight rami, these remote distad and rather crowded proximad, the distal ones sigmoid, the proximal ones more simple arcuate oblique; humeral vein following closely the curve and position of the mediastine vein, the area separating the two very narrow, at about the distal fourth the humeral vein is obtuse-angulate, from whence it follows, at a greater distance than elsewhere, the oblique tendency of the mediastine vein, the point of angulation connected with the discoidal vein by a very short cross nervure; discoidal vein separated from the humeral vein by a relatively broad area, the vein straight

in the proximal two-thirds, but arcuate towards the costal margin in the distal third, obtuse-angulate at the connecting nervure, the short remaining section of the vein directed towards the median vein, which latter is in general straight; stridulating vein broadly rectangulate-arcuate; axillary veins three in number; oblique veins three in number, one complete and two anastomosed with a sinuate accessory longitudinal nervure; diagonal vein straight, oblique; speculum crudely semi-elliptical in shape, obliquely straight delimited proximotursad, with a single transverse vein; postaxillary veins three in number, the median one slightly less distinct than the others and strongly sinuate, the sutural one of the postaxillary veins continuing around the speculum in a regular arcuation. Wings aborted. Cephalic femora slender: cephalic tibiae faintly exceeding the femora in length, slender, weakly expanded about the tympanum, which is elongate elliptical perforate on both faces. Caudal femur moderately robust; appreciably tapering distad: caudal tibiae faintly surpassing the femora in length: caudal metatarsi faintly more than twice as long as the dorso-internal distal spur of the tibiae.

General color antimony yellow, the head strongly washed with vinaceous-rufous.³⁵ Surface of the pronotum with numerous points of rufous, the limbs rather thickly punctulate with prout's brown, on the caudal femora disposed somewhat in the form of short, oblique dashes; caudal tibiae with the smaller spines chiefly and the larger spines apically fuscous. Eyes dresden brown: antennae in the intensive condition with the proximal joint inclined towards naples yellow, with the bullation bearing a longitudinal black figure, which resembles a reversed, robust exclamation mark, but the two sections are connected, mesad of which, at the very base, the segment bears a small black dot; second joint with a transverse, roughly L-shaped, black figure, external face with a faint black dot; remaining antennal segments incompletely and narrowly annulate with fuscous, every two to three segments with the annulation more pronounced and more nearly complete: recessive condition (the type approaching this phase) with the proximal and second antennal joints less strongly marked, although the pattern is evident and the weaker, incomplete annuli of the remaining antennal segments are obsolete or subobsolete. Head with a pair of short, closely placed, postocular fuscous lines.

Length of body, 7.3 mm.; length of pronotum, 1.5; greatest width of pronotum, 1.6; length of tegmen, 7.2; greatest width of dorsal field of tegmen, 3.5; length of caudal femur, 5.

In addition to the type we have before us four paratypic males, two topotypic, and two from Misiones, Argentina (December; P. Jorgensen), all in the collection of the Academy. All of the males of the species examined are in poor condition, either broken or with the color altered, or both, so we are able to give no important comments on individual differences. No features

³⁵ The type is the only specimen seen having the head washed as described above, which condition may be due to discoloration, but it is so uniform and regular it seems best to describe it.

of noteworthy importance, however, appear, aside from those mentioned in the above description. The species is so sharply characterized no difficulty should be encountered in its recognition.

ENEOPTERINAE

Eneoptera surinamensis (DeGeer)

1773. *Gryllus surinamensis* DeGeer, Mém. Hist. Ins., iii, p. 519, pl. 43, fig. 1.
[Surinam.]

Peixe Boi, east of Pará, Pará. November to December, 1907. (H. B. Merrill.) Two males, four females, six immature specimens.

Pará, Pará. (W. M. Mann.) Three males, two females. (C. F. Baker.) Five males, three females.

Manaos, Amazonas. (Mann and Baker.) One male.

Porto Velho, Rio Madeira. (Mann and Baker.) One female.

This series shows the great degree of variation in size and coloration so characteristic of this species. The most striking color feature seen in this series, aside from the shining blackish or dark brownish of the face and the lateral lobes of the pronotum, is the coloring of the dorsal surface of the head, pronotum and dorsal surface of the caudal femora with dull zinc orange. This condition is found in two males and one female from Pará. One Pará male and one female from the same locality are quite uniformly blackish. Two of the Peixe Boi females are more uniformly mummy brown than the average from that or the other localities. The size variation in the Peixe Boi series is as decided as in the remainder of the above recorded representation.

Paroecanthus roosevelti new species (Plate III, figs. 22, 23, 24, 25 and 26.)

This is a very distinct species of the genus, forming with another at present undescribed species, and probably *P. picipes* Bruner, a readily recognized section of the genus. The present insect needs no detailed comparison with the previously known species excepting *picipes*, as its distinctive livery—the dorsum of the head and pronotum being rufescent, the postocular region of the head, the lateral lobes of the pronotum, a spot at the base of the tegmina and all of the limbs, aside from the pale buffy proximal section of the median femora and the similarly colored ventro-proximal

section of the caudal femora, being black—will immediately distinguish it. Bruner's recently described *P. picipes*,³⁶ from Quatro Ojos, Department of Santa Cruz, Bolivia, apparently differs from our species in its distinctly larger size, in the lack of color contrast on the head and pronotum, and doubtless other features not mentioned in the lengthy, but inconclusive, description of *picipes*.

Type.—♂; Bartica, British Guiana. March 24, 1913. (H. S. Parish.) [Acad. Nat. Sci. Phila., Type no. 5331.]

Size small (for the genus): form moderately depressed: surface moderately velutinous. Head subvertical, no wider than the extreme cephalic width of the pronotum, general form of the cephalic aspect of the head broad ovoid, narrowing ventrad: occiput strongly declivent to the subvertical rostrum, which latter is much narrowed between the antennae, its least width not half that of the proximal antennal joint, faintly sulcate: median ocellus not apparent; lateral ocelli large, subovate, placed at the caudal angle of the antennal scrobes and separated from the eyes by less than the short diameter of the ocelli: palpi short, the third joint faintly longer than the fourth, robust; fourth joint enlarging distad; fifth joint very broad and short, subconical, the distal margin subarcuate truncate, the extensor margin arcuate: eyes in basal outline pyriform-ovoid, caudo-ventral margin slightly flattened, when seen from the dorsum the eyes are moderately prominent: antennae considerably surpassing the body in length; the proximal joint large, depressed, dorsal face naked proximad and clothed with hairs distad and on the internal face. Pronotum with the disk regularly expanding caudad, the caudal width of the same subequal to the median length; cephalic margin of the disk gently concave, caudal margin weakly bisinuate, mesad broadly but shallowly arcuate, all margins cingulate; pyriform impressions distinct: lateral lobes distinctly longitudinal, the ventral margin regularly arcuate, ventro-cephalic angle rather narrowly rounded, ventro-caudal angle broadly rounded; surface of the lobes with a dorso-median impressed area, another ventro-cephalad and a third close to the ventro-caudal angle. Tegmina surpassing the apex of the abdomen, also of the caudal femora by more than the length of the pronotum, the greatest width of the dorsal field contained three times in the length of the tegmina, lateral margins of the dorsal fields of the closed tegmina subparallel mesad: costal margin of the usual form found in the genus; marginal field increasing in width to the distal fourth; mediastine vein with twelve sigmoid rami, the proximal section of the marginal field also with four free veins; humeral vein closely paralleling the mediastine vein, distinctly obtuse-angulate at the distal fourth; discoidal vein straighter than the humeral vein mesad, arcuately approaching the same distad; median vein straight; stridulating vein strongly bisigmoid, the proximal bend practically V-shaped; axillary veins four in number, the third (from costal margin) most prominent; anal node prominent; oblique veins six in number, strongly sinuate oblique;

³⁶ Ann. Carneg. Mus., x, p. 422, (1916).

diagonal vein prominent; postaxillary veins three in number, two moderately sigmoid, one arcuate; speculum with its length (oblique) slightly greater than the width, the proximal outline rounded obtuse-angulate, costal outline similar, section toward the sutural margin arcuate, distal arcuation with a rounded disto-costal rectangulation, the speculum with a single cross-vein; distal area with three rami of the median vein. Wings projecting distad of the closed tegmina a distance equal to one and one-half times the length of the pronotum. Cerci falling slightly short of the tips of the closed wings: subgenital plate subcompressed distad, caudal aspect of the same with the margin U-shaped mesad. Limbs rather robust. Cephalic tibiae fusiform, considerably inflated mesad, more slender distad than proximad: cephalic face of the cephalic tibiae with a narrow, linear foraminal opening, the caudal face with a semi-ovate tympanum, the straight portion of the outline of which is flexor in position: cephalic tarsi very short. Caudal femora not two-thirds as long as the tegmina, rather regularly tapering, the distal extremity relatively slender: caudal tibiae armed distad on both margins with four major spines: caudal metatarsi short, the dorsal length but little more than the length of the dorso-internal distal spur of the tibiae, the dorsal margins of the metatarsi armed with one (internal) or two (external) spines.

Allotype.—♀; Madeira-Mamoré Railroad Company Camp. 39, Rio Madeira, Brazil. (Stanford Brazilian Expedition; Mann and Baker.) [Acad. Nat. Sci. Phila.]

The following features are those of difference from the description of the male (type). Lateral ocelli slightly smaller than, but of similar form and in similar position to, those of the male sex, separated from the eyes by about the greatest ocellar length. Pronotum slightly more longitudinal than in the male. Tegmina with the greatest width of the dorsal field contained about four and one-half times in the tegminal length; lateral margins of closed dorsal fields parallel in proximal half: mediastine vein with eight oblique rami, six free veins present proximad in the marginal field; humeral vein following the regular curve of the mediastine vein, being connected with the same by means of a number of short cross-veins, which form small, rectangulate areolets; discoidal and median veins simple, faintly sinuate proximad, the median with four oblique distal rami, which form an integral part of the regular dorsal reticulation; ulnar vein triramosa, the rami regularly oblique and paralleling the anal and axillary veins and the distal rami of the median vein; the anal vein simple, the axillaries two in number, the whole dorsal venation with quite regularly placed cross-veins, which make rectangulate areolets, these becoming irregular proximad between the ulnar and anal veins.

General color of the dorsal surface of the head and pronotum, burnt sienna; of the dorsal field of the tegmina and the visible portion of the closed wings, ochraceous-buff; lateral lobes of the pronotum, genae and palpi, blackish brown; almost all of the cephalic limbs, greater portion of the median limbs, the distal half of the caudal femora and caudal tibiae and tarsi, fuscous. Ventral surface of thorax and coxae light ochraceous-buff, abdomen ventrad pale

cinnamon-brown, the apex of the abdomen of the male, including the subgenital plate and cerci, fuscous. Ocelli light ochraceous-buff; antennae ochraceous-buff to buckthorn brown, washed with fuscous at proximal third, this area showing sparse, very fine annuli of the base color; eyes clove brown. Lateral field of the tegmina washed with mummy brown to fuscous. Cephalic tibiae touched with bister. Median femora with the proximal two-fifths light ochraceous-buff; median tibiae becoming bister. Caudal femora light ochraceous-buff proximad, the distal half and the dorso-proximal section fuscous. Ovipositor chestnut, narrowly margined laterad with blackish brown.

♂ (*type*). Length of body, 12.5 mm.; length of pronotum, 2.3; greatest (caudal) width of pronotum, 3; length of tegmen, 13; greatest width of tegmen, 4; length of caudal femur, 7.2.

♀ (*allotype*). Length of body, 12.3 mm.; length of pronotum, 2.3; greatest (caudal) width of pronotum, 3; length of tegmen, 13.2; greatest width of tegmen, 3; length of caudal, femur, 7.3; length of ovipositor, 4.6.

The type and allotype are the only specimens of this striking species examined by us.

We take pleasure in dedicating this very interesting form to Theodore Roosevelt, in token of our appreciation of his scholarship as a zoologist and a historian and ability as a statesman. The name Roosevelt long will be associated with the Madeiran region as a result of the work of the Expedição Científica Roosevelt-Rondon.

Amblyrhethus ³⁷ **manni** new species (Plate IV. figs. 27, 28, 29, 30, 31 and 32.)

This species agrees with *A. capitatus* (Saussure) in having both faces of the cephalic tibiae provided with foramina, and in the structure of the apex of the ovipositor more closely approximating that species than it does the type found in the other previously known forms. It differs, however, from *capitatus* in its distinctly smaller size, in the slightly narrower fastigium (which is hardly more than twice as broad as the proximal antennal joint), in the form of the lateral lobes of the pronotum, in the more numerous rami of the mediastine vein of the tegmina, in the caudal metatarsi having but two, instead of three, teeth on the dorso-external margin, in the details of the apex of the ovipositor and in certain features of the coloration.

Type.—♂; Independencia, State of Parahyba, Brazil. (Stanford Brazilian Expedition; Mann and Heath.) [Acad. Nat. Sci. Phila., Type no. 5332.]

³⁷ See Kirby, Synon. Catal. Orth., ii, p. 97, (1906). This name replaced the preoccupied *Amblyopus* Saussure.

Size medium: form subdepressed, as usual in the genus: surface of the head, pronotum, venter, abdomen and limbs largely fine pilose. Head with its width slightly greater than the cephalic width of the pronotum: occiput regularly declivent to the rostrum; fastigium broad, very broadly, faintly and very shallowly excavate between the lateral ocelli: rostrum obtuse-angulate in lateral outline, its interantennal width about one and one-half times as great as that of the proximal antennal joint: median ocellus small, situated at the angle of the rostrum; lateral ocelli relatively large, subovoid, touching the dorsal margin of the antennal scrobes, removed from the eyes a distance equal to the short diameter of the ocellus: eyes unsymmetrical ovato-pyriform in basal outline, when seen from the dorsum moderately prominent, with an extremely faint cephalic trend: antennae about twice as long as the body; proximal joint broad, depressed, pilose distad and along the internal face: palpi with the third joint distinctly longer than the fourth joint and subequal in length to the fifth joint; third joint monili-fusiform; fourth joint conical; fifth joint compressed, subelliptical in outline, the distal margin obliquely subtruncate, internal face deeply and broadly excavate. Pronotum slightly transverse, with the greatest median length contained one and one-third times in the greatest caudal width of the disk: cephalic margin of the disk weakly and shallowly concave, caudal margin weakly bisinuate laterad, mesad broadly arcuate; disk gently expanding caudad, all dorsal pronotal margins rather broadly cingulate; median line of the pronotum with cephalic, slightly premedian and minute postmedian impressions, the disk with cephalic, median and paired lateral impressions: lateral lobes moderately longitudinal; ventral margin of the lobes broadly arcuate, the ventro-cephalic angle rather narrowly rounded, the ventro-caudal very broadly rounded, cingulation very narrow on the ventral margin, exceptionally broad ventro-caudad. Tegmina of the type generally found in males of this group, the greatest width at five-eighths the length from the base and contained faintly more than three times in the length of the tegmen, the closed tegmina with the lateral outlines straight and faintly widening distad to the point of greatest width: marginal field of the type usual in this group; mediastine vein with fifteen to sixteen rami, all oblique and sigmoid, free proximal veins of the marginal field three to four in number; humeral and discoidal veins fusing at distal third, proximad of which they enclose a very elongate lanceolate area, distad they roughly parallel the mediastine vein, but are first more angular and then straighter; median vein practically straight to the speculum, where it is very weakly rounded obtuse-angulate, thence straight, weakly oblique to the apex; stridulating vein with its longitudinal section straight, acute-angulate where it bends transversely, thence arcuate and finally straight, the angle with an incomplete longitudinal spur: oblique veins three in number, the first short, arcuate, joining the stridulating vein close to the angle; the second and third oblique, the second straight, the third weakly sinuate, both fusing in a supplementary node, which is connected with the diagonal vein by a strongly arcuate vein and with the stridulating vein by a shorter, arcuate vein: anal node distinct; anal vein strong, oblique, area between this and the stridulating vein occupied by a sub-longitudinal

bifurcate ramus of the anal vein; axillary vein simple, obtuse-angulate before reaching the anal node: diagonal vein arcuate proximad, thence nearly straight longitudinal to the cephalic angle of the speculum; post-axillary veins three in number, the costal two strongly arcuate, the third very faintly arcuate: speculum with its greatest length (oblique) exceeding the greatest width, obtuse-angulate proximad, single transverse vein arcuate costad: distal area with four arcuate rami, the proximal strongly, the distal weakly so, three generally longitudinal nervures springing from the margin of the speculum toward the sutural margin, the entire area reticulate with irregularly placed cross-veins. Wings surpassing the apex of the tegmina by about half the pronotal length. Cerci reaching almost to the tips of the wings: subgenital plate with a small and weak mesal creasing of the distal margin. Limbs relatively short and moderately robust; third joint of all tarsi relatively long and extremely slender. Cephalic tibiae not enlarged, very faintly tapering in distal half; foramen on cephalic face elliptical, on caudal face similar but faintly larger. Caudal femora robust, the greatest width more than a third of the length, distal extremity relatively slender: caudal tibiae with five external and four internal major spines on the distal half, the spinulations of both margins numbering (reading distad) 2, 2, 1, 0, the last space lacking on the internal margin; external distal spurs with the median nearly twice as long as the dorsal, internal distal spurs with the ventral one half as long as the dorsal one: caudal metatarsi no longer than their internal distal spur; armed on the dorso-external margin with two spinulations, the distal one large, the other small, on the dorso-internal margin with a single large distal one.

Allotype.—♀; Same data as type. [Acad. Nat. Sci. Phila.]

This sex differs from the above description of the male (type) in the following noteworthy features. Lateral ocelli relatively smaller. Pronotum more decidedly transverse, its greatest length contained one and one-half times in the greatest caudal width of the disk. Tegmina distinctly surpassing the apices of the caudal femora, reaching almost to the tips of the cerci and ovipositor, when seen from the dorsum the lateral outlines of the dorsal fields are arcuate distad to the apex: marginal field narrowing regularly in the distal half; mediastine vein with eleven to twelve rami, all oblique and but little sigmoid; humeral and discoidal veins simple, parallel, following the curve of the mediastine vein; median vein with its oblique rami (distad) so fused into the general reticulation of the dorsal field that their origin distinct from the other regular oblique sectors of the field is not readily noticed, the sectors moderately direct but somewhat sinuate, eleven in number including those of median origin, all connected by irregular, rather closely placed, cross-veins, which form areolets of irregular shapes but of clear definition. Caudal tibiae with external margin having a secondary spinulation formula of 3, 3, 1, 0, on internal margin, 3, 3, 2. Ovipositor about four-fifths as long as the caudal femora, deplanate; the apex hardly expanded, rather broadly rounded; dorsal valves distad with numerous transverse, closely placed, sinuate, file-like carinations, the arcuate margin of the same area crenulato-denticulate; ventral valves laterad with two obtuse-angulations, the distal margin arcuate, entire.

Coloration practically destroyed, as almost all the material has been immersed in a liquid preservative. The only evident things are the features of fuscous coloration, which are distributed as follows: points at the median and (not always) the caudo-lateral impressions of the pronotal disk; as a wash for a short distance distad of the three proximal antennal joints, this varying in depth and solidarity; as five spots on the dorsal surface of the caudal tibiae, one proximad, the others roughly between pairs of spines; occasionally a washing on the caudal tarsi; as numerous scattered points on the dorsal field of the tegmina of the male, these points larger in the general vicinity of the ends of the anal node, at the base of the anal vein and about the supplementary node, most numerous and thickly dispersed along the distal margin of the speculum, and as a cloud (in intensive individuals only) crossing the distal area of the same field. It would also seem that the mediastine rami and the veins of the distal area are, in undamaged specimens, thickly ticked with fuscous. In the male the humeral angle, the anal node, anal vein and the supplementary node are strongly opaque yellow. In the female the vicinity of the humeral vein is quadrato-punctate with fuscous dorsad in the proximal half, the lateral field has the veins tinted with yellowish and all the veins of both fields are faintly ticked with fuscous. Ovipositor chestnut, becoming fuscous distad, the sculpture of the valves marked with the same.

♂ (*type*). Length of body, 13 mm.; length of pronotum, 2.6; greatest (caudal) width of pronotum, 3.5; length of tegmen, 15; greatest width of dorsal field of tegmen, 5; length of caudal femur, 7.3.

♀ (*allotype*). Length of body, 13.8 mm.; length of pronotum, 3.1; greatest (caudal) width of pronotum, 4; length of tegmen, 15.5; greatest width of dorsal field of tegmen, 4.4; length of caudal femur, 8; length of ovipositor, 6.1.

In addition to the type and allotype, we have before us four paratypic males from Independencia, bearing the same date as the type and allotype, and another male from Bonito, Pernambuco, Brazil (January 27, 1883: A. Koebele; on cotton), the latter from the U. S. National Museum collection. All of the Independencia specimens have been immersed in a preserving fluid, while the Bonito representative is badly damaged, having no caudal and but a single cephalic limb, and the tegmina partly destroyed. In size the males are quite uniform. The oblique veins of the male tegmina vary in number from three (in the type alone) to six (in one paratype), the ones additional to those described in the type all being small, arcuate and placed proximad of the first one discussed in the above description. The number of rami of the mediastine vein in the males sex varies from fourteen to eighteen, of the free veins of the marginal field from two to four. The number of major spines on the dorsal margins of the caudal tibiae, and of the spinulations on the caudal metatarsi,

are the same in the whole series, except for the presence of five spines on the dorsal internal margin in one paratype, but the intercalated spinulations range from 2, 2, 1, 0 to 3, 3, 1, 0 on the external margin; 3, 2, 1-3, 3, 0-3, 3, 2-2, 2, 1-3, 1, 0, 1 on the internal margin. It is evident from these figures how relatively valueless the spinulation count is as a diagnostic feature.

We take pleasure in dedicating this species to Mr. W. M. Mann, to whose energy the extent of the Stanford Brazilian Expedition insect collection is due.

Amblyrethus natalensis new species (Plate IV, figs. 33, 34, 35, 36 and 37.)

This species has the cephalic tibiae supplied with foramina on both faces, as is the case with *capitatus* and the above described *manni*, but the form of the apex of the ovipositor is more like, yet distinct from, that found in *A. brevipes* and *depressus* (Sausure). The present species differs from all the known forms of the genus, however, in having the dorsal surface of the caudal metatarsi armed on the external margin with three, and the internal margin with two spines.

Type.—♂; Natal, State of Rio Grande do Norte, Brazil. (Stanford Brazilian Expedition; W. M. Mann.) [Acad. Nat. Sci. Phila., Type no. 5333.]

Size medium: form robust, but weakly depressed: surface of body and limbs thickly and closely adpressed pilose. Head broad, moderately depressed, the caudal width of the head subequal to the cephalic width of the pronotum; occiput gently arcuate caudad, moderately declivent cephalad, there distinctly, though broadly, excavate: rostrum rectangulate when seen in lateral outline, its least width subequal to the breadth of the proximal antennal joint, with a distinct, broad and rounded medio-longitudinal sulcus, which is weakly continued to the clypeal suture: ocelli placed in an arcuate line; the median one located at the base of the rostrum in the sulcus, subcircular, of medium size; lateral ocelli subcircular in outline, faintly smaller than the median one, removed from the eyes by hardly more than their own diameter and placed close to the margin of the antennal scrobes: palpi very similar to those of *manni*, described above: eyes very similar to those of *manni*, the ventro-cephalic angle of the basal outline, however, more narrowly rounded: antennae at least two and one-half times as long as the body, subincrassate. Pronotum weakly transverse, the greatest caudal width equal to one and two-thirds times the median length of the same, lateral borders of the dorsum subparallel: cephalic margin of disk distinctly angulato-arcuate emarginate; caudal margin of disk faintly arcuate, almost imperceptibly sinuate in the humeral area; dorsal cephalic and caudal margins broadly cingulate: lateral lobes with their greatest

depth contained one and two-thirds times in the length of the same; margins narrowly cingulate, except caudo-ventrad, where they are, as usual, greatly broadened, ventro-cephalic angle rounded rectangulate, ventral margin straight, ventro-caudal angle broadly rounded. Tegmina surpassing the apex of the abdomen and the tips of the caudal femora by a distance equal to about one-half the dorsal length of the pronotum, broad, the greatest width of the dorsal field, which is at five-eighths the length from the base, contained about two and two-thirds times in the length of the tegmina, lateral margins of the closed dorsal fields of the tegmina subparallel in proximal five-eighths of the tegminal length, the distal portion regularly narrowing thence to the apex: lateral field broad, subequal in depth for the greater portion of its length, narrowing briefly distad: mediastine vein with nine to eleven rami, the distal very faintly, the proximal ones appreciably, sigmoid; free veins at base of the lateral field five to six in number; humeral and discoidal veins of the type of structure found in *A. manni*: stridulating vein of the type found in *manni* but the angle is less decided, hardly more acute than a rectangle: anal and axillary veins of the type found in *manni*: oblique veins five in number, the proximal short, the second and third joined shortly before the junction with the stridulating vein, the second sinuate, the third arcuate, the fourth and fifth nearly straight, slightly divergent, coalescing at the proximal fifth in a supplementary node, the fifth oblique vein strongly and briefly arcuate distad, joining the diagonal vein shortly before the anal node: anal node large: diagonal vein arcuate proximad, straight thence, the latter section nearly longitudinal: postaxillary veins three in number, the sutural one but faintly arcuate, the second bent arcuate, the third moderately arcuate: speculum relatively smaller than in *manni*, in form more circular, its diagonal length but slightly greater than the width, margin of the speculum rectangulate proximad, a single oblique cross-vein present: distal area with four radiating rami of the median vein, the rami with numerous regular cross-veins, these less numerous proximad, more numerous distad. Wings very briefly surpassing the apices of the tegmina. Cerci reaching to the wing-tips, tapering, with a clothing of numerous short hairs and sparse, elongate, scattered hairs: subgenital plate as in *manni*. Limbs very short and robust, almost crab-like when flexed: tarsi with the third joint faintly more robust than in *manni*. Cephalic tibiae with a small, elliptical foramen on the cephalic face, a larger elliptical one on the caudal face. Caudal femora not more than two-thirds as long as the tegmina, very broad, the depth contained about two and one-half times in the greatest length of the femur: caudal tibiae very short, not more than two-thirds as long as the femora; dorsal margins each with four major spines, the intercalated spinulations reading distad 2, 2, 0 on the external margin, the same or 1, 1, 0 on the internal margin; distal tibial spurs much as in *manni*, but the internal ones are slightly more robust: caudal metatarsi slightly more elongate proportionately than in *manni*; dorso-external margin with three, internal with two spinulations.

Allotype.—♀; Same data as type. [Acad. Nat. Sci. Phila.]

The following features are those of difference from the description of the male (type) sex. Size larger than in the male sex. Rostrum faintly broader

than the proximal antennal joint; medio-longitudinal sulcus not apparent on the face ventrad of the rostrum: antennae broken. Pronotum but faintly transverse, with the greatest caudal width equal to one and one-third times the median length of the same: greatest depth of the lateral lobes of the pronotum contained about twice in the greatest length of the same. Greatest width of the dorsal field of the tegmina contained three and two-thirds times in the greatest length of the tegmina, lateral margins of the dorsal fields of the closed tegmina very faintly arcuate: lateral field more regularly narrowing distad than in the male: mediastine vein with six strongly oblique, nearly straight rami; free veins of the lateral field four in number: dorsal field with nine rather regularly disposed, oblique sectors, the median two of which are clearly derived from the ulnar vein, the distal four from the median vein, while the proximal three consist of the anal and two axillary veins: cross-veins rather numerous but frequently irregular, where evenly distributed the areolets are rhombic, an irregular reticulation of venules of less importance is also indicated, this passing into the usually more pronounced cross-veins. Wings very slightly surpassing the apices of the tegmina. Ovipositor slightly more than two-thirds as long as the caudal femora, strongly deplanate, relatively broad; dorsal valves with their apices very regularly narrowing to the bluntly rounded tip, surface obliquely striolate along the oblique external margins, which are in consequence microscopically crenulate, and with very fine similar sculpture, directed, however, in the reverse direction, along the internal margins; ventral valves with their apices having the external margins converging to shortly distad of the middle of the valves, there with a minute rectangulate shoulder, and thence distad subequal, the apex rounded and with extremely delicate, microscopical, marginal crenulations. Cerci in broken condition surpassing the wing tips. Caudal tibiae spined as in the male, except for the dorso-external margin on one limb having five major spines.

General coloration of male light pinkish cinnamon, the tegmina cartridge buff: of the female vinaceous-cinnamon to light vinaceous-cinnamon. The maculations and color features which are ambisexual are the following. A fine punctulation, varying in its exact size and density, of blackish fuscous, present on the head, pronotum, limbs and abdomen. The solid markings or closely grouped sections of punctulations of this shade are: paired lateral double postocular bars, separated by a narrow dividing line of the general color, the bars weaker on the head and stronger on the pronotum, the exact outline of the bars poorly defined and subsinuate; a medio-longitudinal line on the cephalic two-thirds of the pronotum, laterad of which is a faint sublyrate pattern; caudal tibiae with a distinct pregenicular semiannular patch on the dorsal and internal faces; antennae with distant, filiform annuli. Tegmina of male with the postanal section solid blackish fuscous; two blotches of the same dorsad of the base of the humeral trunk, the anal and accessory nodes marked with the same shade; two disto-costal and two proximo-sutural blotches surrounding the speculum, the former grouping much more decided than the latter; the discoidal vein in proximal half with checkings of blackish fuscous; obscure reticulation and rugosity of the areas and areolets of the dorsal field frosted

with the same color, the impression given being that of shading on a rough surface with a very soft lead-pencil. Tegmina of the female with the blotch at the base of the humeral trunk present, the remainder of the dorsal field mottled with blackish fuscous, the areolets in some cases quite strongly blotched. Ovipositor cinnamon, lined with blackish, the tip washed with mars yellow.

♂ (*type*). Length of body, 12.8 mm.; length of pronotum, 2.6; greatest (caudal) width of pronotum, 3.8; length of tegmen, 11; greatest width of dorsal field of tegmen, 3.8; length of caudal femur, 7.3.

♀ (*allotype*). Length of body, 16.2 mm.; length of pronotum, 3.8; greatest (caudal) width of pronotum, 4.6; length of tegmen, 14; greatest width of dorsal field of tegmen, 3.8; length of caudal femur, 9.5; length of ovipositor, 7.2.

The type and allotype of this very distinct species are the only individuals seen by us.

Podoscirtus amusus Saussure

1878. *P[odoscirtus] amusus* Saussure, Mélang. Orthopt., ii, fasc. vi, pp. 776, 781. [Pernambuco, Brazil.]

Independencia, Parahyba. (Mann and Heath.) One female.

This specimen is slightly under the original measurements given by Saussure, and it differs in a few very minor features, such as the number of spinulations between the principal spines on the dorsal margins of the caudal tibiae, but in all characters of specific importance it is in full agreement with the description. Saussure says of *amusus*, "Abdomen noir, avec une bande latérale fauve," but it is well to emphasize that the black is only on the dorsal surface, as it is not indicated on the venter.

This is apparently the first record of the species since the original description.

Aphonomorphus³⁸ *cearensis* new species (Plate IV. figs. 38, 39, 40, 41 and 42.)

A very striking small species with a decided and distinctive color pattern, related to *A. griseus* Chopard, from Cayenne, and apparently to *A. hapitheformis* Bruner, from south-central Brazil and eastern Bolivia. From *griseus* it differs in the less decided

³⁸ We have now before us the unique female type of *Platydictylus fasciatus* Scudder (Proc. Bost. Soc. Nat. Hist., xii, p. 331, (1869)), from the Napo or Marañon River. The original describer at a later date, in his revision of the exotic species described by him (Ibid., xxvii, p. 216, (1896)), referred this species to the genus *Eneoptera*, to which, however, it is in no way closely related. The type is much battered, possesses only a few of the proximal joints

pubescence, in the more excavate fastigium, less conspicuous ocelli, in the strongly securiform distal palpal joint, in the shorter pronotum, which has the caudal margin less strongly bisinuate, in the slightly longer than deep lateral lobes of the pronotum, in the entire apex of the male subgenital plate, in the more elongate limbs, in the less numerous rami of the mediastine vein of the tegmina, in the less numerous spines on the dorso-internal margin of the caudal tibiae and in the coloration of the pronotum, dorsal field of the tegmina and of the limbs. From *hapitheformis* the new species differs in the shorter caudal femora, in the narrower tegmina, in the broad foraminal orifice on the cephalic face of the cephalic tibiae, in the dorso-external margin of the caudal metatarsi bearing three spines, and in the distinctive coloration of the dorsal field of the tegmina and of the limbs and palpi.

Type.—♂; Maranguape Mountains, State of Ceará, Brazil. (Stanford Brazilian Expedition; W. M. Mann.) [Acad. Nat. Sci. Phila., Type no. 5334.]

of each antenna, has lost both caudal limbs, a portion of one median one, all of one cephalic limb and all but the femur of the other, in addition to which the palpi are missing. It would seem from Scudder's failure to mention limb characters, that the present condition of the specimen obtained at the time of description. The species is an *Aphononorphus*, quite close to, if not identical with, *A. telskii* Saussure, from Bolivia and Peru. Scudder's specimen differs, apparently, from Saussure's description in having the caudal margin of the pronotum distinctly obtuse-angulate mesad, instead of arcuate and strongly bisinuate as described for *telskii*. The relationship to *variegatus* Chopard, from Cayenne, is also close, and the same is true of *obliquus* Bruner, from Bolivia, but *fasciatus* is evidently more distinct from these than from *telskii*. We are unable to give certain desired comparisons on account of the lack of the important palpal and tibial features, as well as the lack of material of *telskii* for physical comparison.

The ocelli are distinct, in an arcuate line, the lateral ones slightly larger and more circular than the median one, which is distinctly elliptical. The principal measurements of the type of *fasciatus* are: length of body, 19.2 mm.; length of pronotum, 3.4; greatest (caudal) width of pronotal disk, 5.1; length including tegmen, 29.6; length including wing, 35; length of tegmen, 26.5; length of ovipositor, 17.

Size small (for the genus): form moderately elongate, subdepressed: surface finely adpressed pilose except the dorsum of the pronotum, the lateral lobes of the pronotum and the tibiae being quite thickly covered. Head moderately broad: occiput but moderately declivent cephalad, the fastigium and interocular region strongly and broadly excavate, the rostrum and antennal scrobes sharply cut off from the fastigium by a transverse shoulder, which forms, when seen from the dorsum, a very broad, U-shaped figure with diverging arms, on the cephalic face of this shoulder are situated the ocelli: median ocellus of medium size, ovate, the ventral portion fossetted, well separated from the lateral ocelli; lateral ocelli elongate elliptical, concave in form,³⁹ not touching the eyes, distinctly longer than the median one: rostrum very narrow, its least width, which is parallel to the axis of the antennal insertion, being not more than two-thirds the width of the proximal antennal joint, the lateral outline of the rostrum arcuate from the median ocellar fossette ventrad: palpi elongate; the third and fourth joints slender, simple, subequal in length; the fifth joint broadly securiform, the extensor margin concave, the flexor margin strongly convex, the distal margin truncate, the base very slender, the distal section appreciably expanded laterad: eyes slightly prominent, in basal outline short and broad miter-shaped, the greatest width contained about one and one-half times in the depth: antennae reaching at least as far as the tips of the closed wings, proximal joint broad, subdepressed. Pronotum transverse, the median length contained about one and one-half times in the greatest caudal width of the disk: cephalic margin of disk truncate; caudal margin quite strongly bisinuate, arcuate obtuse-angulate mesad; both margins cingulate, the caudal more widely so than the cephalic; lateral borders of the disk appreciably and regularly diverging caudad; paired lateral impressions of disk elliptical, a distinct and moderately decided impression in the middle of the disk: lateral lobes of the pronotum weakly longitudinal, the greatest depth contained one and one-third times in the length of the lobe; ventral margin distinctly and regularly arcuate, the ventro-cephalic angle broadly rounded, the caudal angle obtusely rounded, margins finely cingulate cephalad and ventrad, very broadly lamellato-cingulate ventro-caudad; surface of the lobes much impressed ventro-caudad. Tegmina elongate, relatively narrow, the tips very faintly surpassing the apices of the caudal femora and surpassing the apex of the abdomen by nearly the length of the head and pronotum combined, when seen from the dorsum the closed dorsal fields narrow regularly from the base: costal margin very faintly concave at its middle: lateral field subequal in width from the base to its middle, thence narrowing to its apex, which very shortly precedes that of entire tegmen: mediastine vein with five rami, the lateral field with four free veins; humeral and discoidal veins in the proximal half following the curve of the mediastine vein, thence the discoidal forms the internal border of the lateral field; the humeral vein distad follows the general course of the discoidal vein, somewhat irregular and sending off poorly

³⁹ These are similar to the shape of the antennal fossae immediately ventrad and are probably a development to permit of the antennae being directed caudad, the large proximal joint having little play, without some cutting away in this region.

defined rami toward the costal margin distad of the extremity of the mediastine vein: dorsal field areolate-reticulate with fair-sized interstices, oblique pseudo-sectors four in number, distad of which are two strongly longitudinal sectors, which are rami of the median vein, and proximad of which is a closely placed series of three straight, oblique, anulo-axillary veins. Wings projecting distad of the closed tegmina a distance almost equal to that of the head and pronotum combined. Cerci short, not more than twice as long as the subgenital plate, robust and tapering in the distal half, the apex rather abruptly tapered; distal half decurved: subgenital plate deplanate ventrad, non-sulcate, the lateral margins narrowing distad; apex of the plate rather sharply truncate. Limbs slender; third joint of all tarsi very slender. Cephalic tibiae imperforate on caudal face, with an elongate ovoid foramen on the cephalic face. Caudal femora quite slender, the greatest depth contained four and one-half times in the length of the same: caudal tibiae with five major spines, which are quite slender, on each dorsal margin distad; intercalated spinulations reading distad-3, 3, 0, 0, on each margin; external distal spurs very small; internal spur group with the dorsal one large, the intermediate but little more than one-half as long as the dorsal and the ventral one one-third as long as the dorsal one: caudal metatarsi short, dorsad armed with two spinulations on the external margin and one on the internal one; internal metatarsal spur about as long as the metatarsus.

General coloration cinnamon-buff, brightening to light buff and pinkish buff as follows: narrow postocular line which is continued over the shoulder of the pronotum and proximal third of the humeral angle of the tegmina; four equally narrow, longitudinal, occipital lines on the head, the median pair connected cephalad; a pair of fine sigmoid lines obliquely crossing the eye and separated by a narrow fuscous division. Antennae with infrequent and rather weak annuli of fuscous, which are more numerous distad: ocelli pinkish buff; dorsal section of antennal scrobes and most of face blackish fuscous, except for a central trefoil figure on the face: genae washed with natal brown: palpi with the second, third and fourth segments lined on the external and internal faces with fuscous, distal joint with the same distad, a dorsal lining of buff on the third and fourth joints. Pronotum with dorsal surface, except lateral angles and paired impressed areas, washed with buckthorn brown, a medio-longitudinal line of blackish fuscous present; lateral lobes washed with natal brown, pubescence pale golden. Tegmina with the dorsal field having five distinct groups of blackish fuscous markings along the oblique "sectors," other scattered points of the same color indicated, particularly distad, a distinct, well-spaced beading of fuscous black along the median vein; vicinity of the proximal two-fifths of the humeral vein continuously marked with fuscous black, costal margin with a faint ticking of fuscous distad. Abdomen with dorsum fuscous and a relatively broad medio-longitudinal bar on the center of the same color, this as wide distad as the truncate extremity of the subgenital plate: cerci pale ochraceous buff with the distal extremity sharply fuscous. Cephalic femora, the greater portion of the cephalic tibiae and tarsi, the disto-ventral section of the median femora, much of the median tibiae and

tarsi, the ventral half of the caudal femora and the lateral and ventral faces of the caudal tibiae and tarsi, blackish fuscous; ocelliform spots of the general color are placed in the fuscous areas on the cephalic and median femora and tibiae, and a sparse beading of the same color is present on the ventro-external margin of the caudal femora; dorsal surface of the cephalic tibiae weakly hay's russet, a faint indication of the same on the median tibiae; caudal tibiae with the dorsal surface clear buff-yellow.

Length of body, 12.1 mm.; length of pronotum, 2.1; greatest (caudal) width of pronotum, 3.3; length of tegmen, 13.3; greatest width of dorsal field of tegmen, 3; length of caudal femur, 9.6.

The type of this striking and interesting species is unique.

Aphonomorphus novus new species (Plate IV, figs. 43, 44, 45, 46 and 47.)

A very distinct species, showing so many characteristic features that it is inadvisable to give a comparative diagnosis. Its main features are: its small size, slender form (in both sexes), its greatly expanded distal palpal joint, its distinctly longitudinal and relatively complete tegminal venation, which is also in high relief, its pauciramose tegminal mediastine vein, its narrow, yet elliptical, foramen on the cephalic face of the cephalic tibiae, its caudal tibiae with five spines on each dorsal margin and its caudal metatarsi with two teeth on each lateral margin. The structure of the subgenital plate of the male much suggests that of *hapitheformis* Bruner and *cearensis*, described above, but no really close relationship to these species exists.

Type.—♂; Independencia, State of Parahyba, Brazil. (Stanford Brazilian Expedition; Mann and Heath.) [Acad. Nat. Sci. Phila., Type no. 5335.]

Size small: form slender, elongate, in general section subquadrate: surface of body adpressed pubescent, of tegmina very delicately pubescent, this microscopic. Head with its width no greater than the cephalic width of the pronotum, the eyes not projecting laterad of the general outline of the head: occiput, fastigium and dorsal section of the rostrum to the angle, which is interantennal, regularly and strongly declivent; rostrum nearly rectangulate in lateral outline, its least width less than one-half that of the proximal antennal joint, fossulate dorsad: ocelli large, placed in a strongly arcuate line; median one quite large, nearly circular, placed in the fossulation at the base of the rostrum; lateral ones slightly smaller than the median one, elliptical, moderately separated from the median ocellus and well removed from the eye, the surface of the lateral ocelli concave: palpi of medium length; third and fourth joints simple, the fourth slightly shorter than the third; fifth joint securiform, the dorsal outline of the joint straight, the distal margin truncate, the ventral

margin strongly arcuate: eyes weakly projecting cephalad, appreciably compressed laterad, in basal outline subreniform, broader dorsad than ventrad: antennae at least twice as long as the body, relatively heavy, moniliform, the joints longest mesad; proximal joint depressed, its dorsal surface impressed. Pronotum moderately transverse, its median length contained about one and one-half times in the greatest caudal width of the same, dorsal surface strongly arcuate in transverse section, broadly rounding into the lateral lobes: cephalic margin of disk concavo-truncate, caudal margin bisinuate laterad, very broadly obtuse-angulate mesad; lateral borders of disk regularly, though not strongly, diverging caudad; paired impressions of the disk ovoid in shape: lateral lobes decidedly longitudinal, slightly deeper caudad than cephalad, the caudal depth contained about one and two-thirds times in the greatest length of the lobes; ventral margin of the lobes arcuate, the ventro-cephalic and caudal angles broadly rounded. Tegmina reaching to the apices of the caudal femora and surpassing the apex of the abdomen by the length of the head and pronotum combined, very elongate, the greatest width of the dorsal field contained nearly five and one-half times in the length of the same: lateral field subequal in depth in proximal third, regularly narrowing thence; mediastine vein triramous; lateral field with three free veins proximad; humeral and discoidal veins simple: dorsal field with sharply defined, elevated and regularly spaced, relatively simple, longitudinal venation, the cross-veins weak, rather irregular and often sigmoid: median vein straight, with three rami, which are as longitudinal as the median vein itself, the distal more distinct in its origin than the median and proximal ones; anal and three axillary veins distinct and regular. Exposed portion of the closed wings slightly longer than the length of the head and pronotum combined. Cerci short, not surpassing the apices of the tegmina when extended, sharply tapering proximad, very gradually so and very slender distad, falcate, strongly decurved: subgenital plate as in *cearensis* but the distal margin weakly arcuate. Limbs slender, the cephalic and median femora deeper than usual in limbs in general so slim: third tarsal joint slender in all tarsi. Cephalic tibiae with cephalic face having an elongate elliptical foramen, imperforate on caudal face. Caudal femora with the greatest depth contained about four and one-half times in the greatest length: caudal tibiae very slender; dorsal margins armed distad with five major spines, which are very slender, the intercalated spinulations on the external margin numbering (reading distad) 6, 5, 2, 2 or 4, 4, 3, 2—on the internal margin, 3, 3, 2, 1 or 3, 3, 3, 1; distal external spurs small, the dorsal little more than half as long as the median, and the ventral but little smaller than the median; distal internal spurs elongate, the ventral about two-fifths as long as the dorsal, which latter is but little shorter than the metatarsus: caudal metatarsi with dorso-external margin with two spinulations, dorso-internal margin with a single (distal) spinulation; internal metatarsal spur about as long as the metatarsus, external one somewhat shorter.

Allotype.—♀; Same data as type. [Acad. Nat. Sci. Phila.]

Differing from the description of the male (type) in the following features. Size larger. Head slightly shorter and broader: eyes less projecting cephalad:

genae more inflated than in the male. Tegmina with dorsal field having eight almost longitudinal sectors, the four distal being rami of the median vein, the next is the ulnar vein, the anal following and finally two axillary veins: the sectors derived from the median vein are connected by infrequent cross-veins, which are placed at right angles to the rami themselves, between the other sectors the cross-veins are nearly longitudinal, somewhat irregular in position and distinctly sigmoid in shape, excepting distad, where the cross-veins take the position and disposition they assume between the sectors derived from the median vein, a tendency toward false intercalated longitudinal nervures is seen proximad. Cerci slightly surpassing the tips of the tegmina. Ovipositor but slightly shorter than the caudal femora, compressed; apex acuminate, the extreme tip very acute, ventro-laterad armed with strong, rather irregular, recurved teeth, the dorsal surface of the apex slightly flattened, the external surfaces moderately rounded and strongly shagreenous. Caudal tibiae with intercalated spinulation formula on the external margin, 7, 6, 3.2—on the internal margin, 4, 4, 3, 0.

Coloration tones completely destroyed by immersion in a liquid preservative. The only evident features are: a regularly placed pattern of very small fuscous punctulations on the pronotum, cephalic and median limbs, distal extremity of the caudal femora and (sparsely) greater portion of the caudal tibiae; a relatively narrow fuscous postocular bar on the head and pronotum, which is narrow and not sharply defined; a medio-longitudinal bar of fuscous on the head and pronotum, this being divided by a thread of the general color; lining with fuscous of the proximal third of the humeral vein of the tegmina; median vein of the wing sparsely and strongly, and the longitudinal veins of the exposed portion of the folded wings, more closely and less distinctly, ticked with fuscous; eyes obliquely trilineate with fuscous, the lines somewhat sigmoid; antennae very sparsely annulate with fuscous; ventral surface of the caudal tibiae washed with weak fuscous; ovipositor narrowly lined with fuscous laterad, the apex ventrad washed with the same.

♂ (*type*). Length of body, 10.6 m.; length of pronotum, 1.9; greatest (caudal) width of pronotum, 2.8; length of tegmen, 11.8; greatest width of dorsal field of tegmen, 2.2; length of caudal femur, 9.2.

♀ (*allotype*). Length of body, 12.2 mm.; length of pronotum, 2.2; greatest (caudal) width of pronotum, 3.3; length of tegmen, 13.3; greatest width of dorsal field of tegmen, 2.5; length of caudal femur, 11.1; length of ovipositor, 8.8.

The type and allotype are the only specimens of this easily recognized species seen by us. The variation in the formulas of the intercalated spinulations of the dorsal margins of the caudal tibiae show how unimportant these features are, and how little dependence can be placed upon them as diagnostic characters.

Aphonomorphus peruvianus (Saussure)

1874. *Aphonus peruvianus* Saussure, Miss. Scient. Mexiq., Rech. Zool., vi, pp. 510, 511. [Tarma, Peru.]

Madeira-Mamoré Railroad Company Camp 41, Rio Madeira. (Mann and Baker.) One male.

The present specimen agrees quite well with the original description, except that the median ocellus is ovate instead of round, more ovate than the lateral ones, and for the presence of a very weak, medio-longitudinal impression distad on the sub-genital plate of the male, which plate is described as "non cannelée." Until we are able to compare the Rio Madeira specimen with material more fully typical of *peruvianus*, we prefer to use that name, tentatively, for the present individual.

Tafalisca bahiensis (Saussure)

1878. *M[etrypus] bahiensis* Saussure, Mélang. Orthopt., ii, fasc. vi, pp. 812, 816. [Bahia, Brazil.]

Independencia, Parahyba. (Mann and Heath.) One female.
Pará, Pará. (C. F. Baker.) One female.

These specimens are referred to *bahiensis* with some uncertainty, as they show certain differences from the original description which may be of specific worth, or may, as seems to us more probable, be features of individual variation. The latter opinion is strengthened by the differences between the two specimens in hand, which, while certainly representing the same species, vary in size, intensity and continuity of the dark head marking and spination of the dorsal surface of the caudal metatarsi. From Saussure's description of *bahiensis* the present material differs in the slightly smaller pronotum, in the caudal margin of the disk of the same being but moderately arcuate instead of angularly rounded, and in the caudal metatarsi having the dorsal surface armed with 2:3 or 3:3, instead of 2:4, spiniform denticulations. Each of the present specimens possesses but a single caudal limb, and the Pará specimen has the 3.3 formula on the single metatarsus, the Independencia individual the 2:3 arrangement. The present specimens have the darker pattern of the head strongly infuscate, while the angle of the tegmina has the trunk with a greater (Pará) or less (Independencia) amount of infuscation, as is true of the apex of the caudal femora. It seems that, aside from the pronotum, the described reddish

areas are darkened in the present representatives. In the Independencia female the pronotum bears a distinct, fuscous, postocular bar, while both specimens have paired short, infusate, infraocular bars on the head. The dorsal ovipositor valves are little expanded, the margins moderately arcuate acuminate; the ventral valves are less acuminate, with the margins of these coarsely, but not deeply, crenulato-dentate, of the dorsal valves finely multicarinulate distad on the dorsal surface. The measurements (in millimeters) of the specimens are as follows:

	Length of body	Length of pro- notum	Greatest width of pronotum	Length of teg- men	Length of cau- dal femur	Length of cau- dal tibia	Length of ovi- positor
Pará	20.5	4.7	4.7	14.4	13	9	10.8
Independencia . .	18.3	4.2	4.3	13.6	10.8	8.4	9.6

EXPLANATION OF PLATES

Plate III

- Fig. 1.—*Hyperophora branneri* new species. Dorsal view of apex of abdomen of male (*type*). ($\times 3$)
- Fig. 2.—*Hyperophora branneri* new species. Stridulating field of tegmen of male (*type*). ($\times 3$)
- Fig. 3.—*Hyperophora abrupta* new species. Dorsal view of apex of abdomen of male (*type*). ($\times 3$)
- Fig. 3 A.—*Hyperophora abrupta* new species. Stridulating field of tegmen of male (*type*). ($\times 3$)
- Fig. 4.—*Ceraia grandis* new species. Dorsal view of apex of abdomen of male (*type*). ($\times 3$)
- Fig. 5.—*Ceraia grandis* new species. Lateral outline of ovipositor and subgenital plate. *Allotype*. ($\times 2$)
- Fig. 6.—*Ceraia madeirensis* new species. Outline of sternal lobes. *Type*. ($\times 4$)
- Fig. 7.—*Ceraia madeirensis* new species. Lateral outline of ovipositor and subgenital plate. *Allotype*. ($\times 3$)
- Fig. 8.—*Anaulacomera rusa* new species. Lateral outline of apex of abdomen of male (*type*). ($\times 4$)
- Fig. 9.—*Anaulacomera rusa* new species. Ventral view of apex of abdomen of male (*type*). ($\times 4$)
- Fig. 10.—*Anaulacomera ovibos* new species. Ventral outline of subgenital plate of male (*type*). ($\times 5$)
- Fig. 11.—*Anaulacomera ovibos* new species. Caudal aspect of apex of abdomen of male (*type*). ($\times 3$)
- Fig. 12.—*Anaulacomera ovibos* new species. Lateral view of apex of abdomen of male (*type*). ($\times 3$)
- Fig. 13.—*Anaulacomera bovicula* new species. Caudal aspect of apex of abdomen of male (*type*). ($\times 3$)
- Fig. 14.—*Anaulacomera bovicula* new species. Lateral view of apex of abdomen of male (*type*). ($\times 3$)
- Fig. 15.—*Coelophyllum crassum* new species. Dorsal aspect of head, pronotum and stridulating field of tegmen of male (*type*). ($\times 2$)
- Fig. 16.—*Coelophyllum crassum* new species. Lateral outline of tegmen of male (*type*). ($\times 2$)
- Fig. 17.—*Teleutias tortus* new species. Dorsal aspect of pronotum of male (*type*). ($\times 3$)
- Fig. 18.—*Teleutias tortus* new species. Apex of abdomen of male (*type*) from dorsum. ($\times 3$)
- Fig. 19.—*Oecanthus pictipes* new species. Outline of dorsum of pronotum of male (*type*). ($\times 5$)
- Fig. 20.—*Oecanthus pictipes* new species. Dorsal field of male tegmen (*type*). ($\times 3$)

- Fig. 21.—*Oecanthus pictipes* new species. Lateral field of male tegmen (*type*). ($\times 3$)
- Fig. 22.—*Paroecanthus roosevelti* new species. Cephalic face of cephalic tibia of *type*. (Greatly enlarged.)
- Fig. 23.—*Paroecanthus roosevelti* new species. Foramen on caudal face of cephalic tibia of *type*. (Greatly enlarged.)
- Fig. 24.—*Paroecanthus roosevelti* new species. Palpus of *type*. (Greatly enlarged.)
- Fig. 25.—*Paroecanthus roosevelti* new species. Outline of dorsal field of tegmen of male (*type*). ($\times 2$)
- Fig. 26.—*Paroecanthus roosevelti* new species. Apex of dorsal valves of ovipositor of *allotype*. (Greatly enlarged.)

Plate IV

- Fig. 27.—*Amblyrhethus manni* new species. Outline of dorsal field of tegmen of male (*type*). ($\times 2$)
- Fig. 28.—*Amblyrhethus manni* new species. Outline of lateral lobe of pronotum of *type*. ($\times 3$)
- Fig. 29.—*Amblyrhethus manni* new species. Cephalic aspect of head of *type*. ($\times 4$)
- Fig. 30.—*Amblyrhethus manni* new species. Dorsal outline of apex of single dorsal valve of ovipositor of *allotype*. (Greatly enlarged.)
- Fig. 31.—*Amblyrhethus manni* new species. Ventral outline of apex of single ventral valve of ovipositor of *allotype*. (Greatly enlarged.)
- Fig. 32.—*Amblyrhethus manni* new species. Cephalic face of cephalic tibia of *type*. (Greatly enlarged.)
- Fig. 33.—*Amblyrhethus natalensis* new species. Outline of dorsal field of tegmen of male (*type*). ($\times 2$)
- Fig. 34.—*Amblyrhethus natalensis* new species. Cephalic aspect of head of *type*. ($\times 4$)
- Fig. 35.—*Amblyrhethus natalensis* new species. Dorsal outline of apex of single dorsal valve of ovipositor of *allotype*. (Greatly enlarged.)
- Fig. 36.—*Amblyrhethus natalensis* new species. Ventral outline of apex of single ventral valve of ovipositor of *allotype*. (Greatly enlarged.)
- Fig. 37.—*Amblyrhethus natalensis* new species. Cephalic face of cephalic tibia of *type*. (Greatly enlarged.)
- Fig. 38.—*Aphonomorphus cearensis* new species. Dorsal outline of pronotum, tegmina and closed wings of male (*type*). ($\times 2\frac{1}{2}$)
- Fig. 39.—*Aphonomorphus cearensis* new species. Cephalic aspect of head of *type*. ($\times 6$)
- Fig. 40.—*Aphonomorphus cearensis* new species. Outline of subgenital plate of male (*type*). (Greatly enlarged.)
- Fig. 41.—*Aphonomorphus cearensis* new species. Palpus of *type*. (Greatly enlarged.)
- Fig. 42.—*Aphonomorphus cearensis* new species. Cephalic face of cephalic tibia of *type*. (Greatly enlarged.)

- Fig. 43.—*Aphonomorphus novus* new species. Lateral outline of pronotum of type. ($\times 5$)
- Fig. 44.—*Aphonomorphus novus* new species. Dorsal outline of head, pronotum, tegmina and closed wings. ($\times 3\frac{1}{4}$)
- Fig. 45.—*Aphonomorphus novus* new species. Outline of subgenital plate of male (*type*). (Greatly enlarged.)
- Fig. 46.—*Aphonomorphus novus* new species. Palpus of type. (Greatly enlarged.)
- Fig. 47.—*Aphonomorphus novus* new species. Cephalic face of cephalic tibia of type. (Greatly enlarged.)



